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# Turridae (Mollusca: Gastropoda) of southern Africa and Mozambique. Part 4. Subfamilies Drilliinae, Crassispirinae and Strictispirinae

by

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SYNOPSIS

71 species (42 previously undescribed) are covered: Drilliinae (33 species), Strictispirinae (3), Crassispirinae (35).

New genera: *Orrmaesia, Acinodrillia* (Drilliinae); *Inkinga* (Strictispirinae); *Naudedrillia, Nquma, Psittacodrillia, Calcatodrillia, Funa* (Crassispirinae).

New species: Drilliinae: *Acinodrillia viscum, A. amazimba; Clavus groschi; Tylotiella isibopho, T. basipunctata, T. papilio, T. herberti, T. sulekile, T. quadrata, Agladrillia ukuminxa, A. piscorum; Drillia (Drillia) spirostachys, D. (Clathrodrillia) connelli; Orrmaesia dorsicosta, O. nucella; Splendrillia mikrokamelos, S. kylix, S. alabastrum, S. skambos, S. sarda, S. daviesi.* Crassispirinae: *Crassiclava balteata; Inquisitor nodicostatus, I. arctatus, I. latiriformis, I. isabella, Funa fraterculus, F. asra; Naudedrillia filosa, N. perardua, N. cerea, N. angulata, N. nealyoungi, N. mitromorpha; Pseudexomilus fenestratus; Ceritoturris nataliae; Nquma scalpta; Haedropleura summa; Mauidrillia felina; Calcatodrillia chamaeleon, C. hololeukos; Buchema dichroma.*

New generic records: *Clavus* Montfort, 1810, *Tylotiella* Habe, 1958, *Iredalea* Oliver, 1915, *Splendrillia* Hedley, 1922, *Agladrillia* Woodring, 1928 (Drilliinae); *Paradrillia* Makiyama, 1940 (Strictispirinae); *Crassiclava* McLean, 1971, *Pseudexomilus* Powell, 1944, *Haedropleura* Monterosato in Bucquoy, Dautzenberg & Dollfus, 1883, *Mauidrillia* Powell, 1942, *Buchema* Corea, 1934, *Ceritoturris* Dall, 1924 (Crassispirinae).

New species records: *Iredalea exilis* (Pease, 1868), *Clavus unizonalis* (Lamarck, 1822) (Drilliinae); *Paradrillia melvilli* Powell, 1969 (Strictispirinae); *Funa tayloriana* (Reeve, 1846), *Turridrupa cincta* (Lamarck, 1822), *T. acutigemmata* (E. A. Smith, 1877) (Crassispirinae).

Reclassification: *Paradrillia* is transferred from the Clavinae to the Strictispirinae, *Turridrupa, Ceritoturris, Haedropleura* and *Mauidrillia* from the Clavinae to the Crassispirinae, *Pseudexomilus* from the Daphnellinae to the Crassispirinae; *Drillia signa* Bartsch, 1915 (based on a teratological *Clionella* or *Clavatula*) to the Clavatulinae.

New combinations: *Pleurotoma inclinata* Sowerby, 1893, to *Iredalea*; *P. burnupi* Sowerby, 1897, *P. hottentota* E. A. Smith, 1882, and *Drillia falcicosta* Barnard, 1958, to *Tylotiella; Drillia falsa* Barnard, 1958, and *D. eva* Thiele, 1925, to *Splendrillia, Pleurotoma? paula* Thiele, 1925, to *Acinodrillia* (Drilliinae); *Drillia laterculoides* Barnard, 1958, and *Pleurotoma tayloriana* Reeve, 1846, to *Funa*; *Pleurotoma layardi* Sowerby, 1897, *Drillia omia* Barnard, 1958, and *Clavatula halistrepta* Bartsch, 1915, to *Crassiclava*; *Drillia praetermissa* E. A. Smith, 1904, to *Naudedrillia; Pleurotoma rousi* Sowerby, 1886, to *Nquma*; *Cythara ima* Bartsch, 1915, to *Haedropleura*; *Pleurotoma diversa* E. A. Smith, 1882, *P. bairstowi* Sowerby, 1886, and *Drillia albonodulosa* E. A. Smith, 1904, to *Psittacodrillia* (Crassispirinae).

New synonyms: *Drillia distincta* Thiele, 1925 = *Drillia (Drillia) lignaria* (Sowerby, 1903); *Drillia sowerbyi* Turton, 1932 (*non* Reeve, 1843) = *Crassiclava hottentota* (Sowerby, 1897); *Haedropleura dora* Thiele, 1925 = *H. ima* (Bartsch, 1915); *Vexitomina* Powell, 1942 = *Paradrillia* Makiyama, 1940.

Types figured: Holotypes of *Drillia falsa* Barnard, 1958, *Pleurotoma castanea* Reeve, 1845, *P. tayloriana* Reeve, 1846, *P. hottentota* Smith, 1882, *P. variabilis* Smith, 1877, *Surcula macilenta* Melvill, 1923 (*non* Solander, 1766) [= *Turris macella* Melvill, 1923]; *Drillia signa* Bartsch, 1915, *Mangilia benjamini* Bartsch, 1915. Lectotypes of *Drillia omia* Barnard, 1958, *D. falcicosta* Barnard, 1958, *D. laterculoides* Barnard, 1958, *D. pusilla* Garrett, 1873, *Pleurotoma diversa* Smith, 1882, *P. lignaria* Sowerby, 1903. Syntypes of *Drillia exilis* Pease, 1868, *Pleurotoma inclinata* Sowerby, 1893, *Mangilia decaryi* Dautzenberg, 1932.

*Nomina dubia: Drillia pecus* Barnard, 1969; *D. signa* Bartsch, 1915; *D. neptuni* Turton, 1932.

Radulae figured: *Tylotiella basipunctata, Clavus unizonalis, Iredalea exilis, Drillia (Clathrodrillia) connelli, Orrmaesia dorsicosta* (Drilliinae); *Paradrillia melvilli* (Strictispirinae); *Turridrupa cincta, T. bijubata, Inquisitor arctatus, I. nodicostatus, I. isabella, I. latiriformis, Funa laterculoides, F. taylorianum, F. asra, Naudedrillia praetermissa, N. filosa, N. nealyoungi, N. mitromorpha, Crassiclava halistrepta, Nquma scalpta, N. rousi, Calcatodrillia chamaeleon, Mauidrillia felina, Haedropleura ima, H. summa, Crassopleura maravignae.*

## INTRODUCTION

The present study deals for the most part with genera united by Powell (1966) in the subfamily Clavinae. These share a similar shell form, in that they all exhibit a high spire, a relatively short, truncate base, and (with few exceptions) a parietal pad or nodule that serves to buttress the extreme posterior end of the labrum (which would otherwise be weakened by the anal sinus). This 'clavine facies' seems to have evolved as an adaptation to a reef or under-rock existence, as opposed to the produced siphonal canal and non-reinforced labral extremity (the 'turrine facies') of the predominantly sand-dwelling Turrinae and Cochlespirinae.

Within the Clavinae of Powell occur a number of radula types that McLean (1971a) demonstrated to be indicative of polyphyly. One group, with true toxoglossate dentition, has already been dealt with (Kilburn 1986) under the Borsoniinae. The remainder of the Clavinae were divided by McLean into five subfamilies, three of which prove to occur in southern Africa and Mozambique. Subsequently Cernohorsky (1985) showed that the name Clavinae was invalidated by homonymy, the subfamilial name Drilliinae being available in its stead; consequently the term 'clavine' or 'claviform' will be used here as a convenient descriptive term for the shell facies described above. In this sense, 'clavine' is not intended to convey any taxonomic implications except in so far as the term applies loosely to all three subfamilies covered here.

A valuable account of the structure and functional morphology of the different radula-types found in the Turridae was given by Shimek & Kohn (1981). The observations of Maes (1983) have modified some of their conclusions. Of the three 'clavine' subfamilies occurring in the southern African region, the Drilliinae is characterised by its broad, pectinate lateral plates (Figs 6–11). Typically with a radula formula of 1–1–R–1–1, this is certainly the most primitive subfamily, although the term 'prototypic', applied to its radula by Powell (1966), does involve an untestable assumption. This style of radula is here termed 'drilliine'. Although hypothetically considered to be adapted for 'slicing-rasping' by Shimek & Kohn, Maes (1983) demonstrated that it was used solely for gripping (and/or pricking) the prey, which is swallowed intact. In the two other subfamilies, the radula is (with few exceptions), reduced to two rows of marginal plates. In the Crassispirinae (Figs 39–56) each plate is buttressed by an accessory limb, enabling the radula to be used in pricking and slashing ingested polychaete prey for the penetration of venom (and possibly lytic enzymes). In the third subfamily, the Strictispirinae, an accessory limb is fused to each marginal tooth, its distal end being recurved to form a median flange or collar (Fig. 17). This group is also characterised by the loss of the venom gland and bulb (Maes 1983), but the provision of strong circular muscles around the foregut and a large odontophore indicate that the ingested prey is ripped apart with the aid of the solid, hooked radula teeth.

The 'clavine' genera are the most difficult of the Turridae to classify and characterise, particularly as some genera are still known only from shell characters. The latter taxa can only be classified by an estimate of their apparent affinities to genera whose radula has been examined. This also applies to the large number of southern African species that have not yet been collected alive. Reassessment of relationships will prove inevitable as material becomes available.

A master-key to all the clavine genera based on shell characters has not proved feasible. Within subfamilies I have given keys to genera, although these are of doubtful value, as routine examination of radulae for identification purposes is not a practical option. Consequently, figures are grouped together as an additional, pictorial aid to identification.

## Fossil species

Two species of 'clavines' are on record from the Miocene of Zululand, *'Drillia' curiosa* King (1953: 84, text fig. 10) and *Crassispira (Inquisitor) coxana* King (1953: 85, text fig. 5). From the sketchy figures provided it is impossible to judge whether these are even Turridae. The types (now in the Geological Survey, Pretoria, pers. comm. Dr M. Cooper) will have to be studied afresh. *Drillia tempestae* Kensley & Pether, 1986: 195, fig. 31) from the early Pliocene of Namaqualand, lacks a clavine anal sinus, and is probably a *Clionella* (subfamily Clavatulinae).

## Biogeography in southern Africa

The subfamilies Drilliinae and Crassispirinae are too poorly known to permit anything but a simplistic analysis of their biogeography in southern Africa and Mozambique. Furthermore, such results will be heavily biased, as the samples available from the east coast (and to a lesser extent the Cape littoral) are far more extensive than those from the Agulhas Bank and west coast. With these provisos in mind, a few preliminary comments can be made. (The subfamily Strictispirinae is not considered, as species are too few for meaningful analysis.)

No species of Drilliinae are known from the cold temperate Atlantic coast, whereas approximately 11% of known regional species of Crassispirinae occur there. On the other hand, bathyal elements are fewer in the Crassispirinae (about 6% of species) than in the Drilliinae (27%). Proportions of Indo-Pacific incursives are roughly similar (*ca* 14–15%) in both subfamilies, as are Cape/Transkei warm temperate littoral and shelf elements (*ca* 42–46%), although the number of Agulhas Bank endemics may be slightly greater in the Drilliinae. Natal littoral and shelf endemics are proportionally more numerous (*ca* 46% of species) in the Crassispirinae than in the Drilliinae (24%).

## ABBREVIATIONS

a/l = ratio of aperture length (measured along main shell axis) to total shell length.
b/h = ratio of maximum breadth to its height.
b/l = ratio of shell breadth to total length.
ANSP = Academy of Natural Sciences of Philadelphia.

BM(NH) = British Museum (Natural History).
IRSN = Institut Royal des Sciences Naturelle de Belgique, Brussels.
*MN* = R/V *Meiring Naude*.
NM = Natal Museum.
OUM = Oxford University Museum.
*PF* = s.s. *Pieter Faure*.
SAM = South African Museum, Cape Town.
USNM = National Museum of Natural History, Washington.
ZMA = Zoologisch Museum, Universiteit van Amsterdam.
ZMB = Zoological Museum, Humboldt University, East Berlin.

## METHODOLOGY

Colour terminology in the main descriptions follows the ISCC–NBS system. Radula preparations for the light microscope were stained with Chlorazol Azurine and Shirlastain A, and mounted in polyvinyl lactophenol. Diagnoses are intended as précis of diagnostic characters, and in the case of species, are extracted from the formal descriptions (which obviously take precedence in the case of an accidental contradiction), usually after visual comparison of specimens and tabulation of characters.

## TAXONOMY

### Rejected records

*Pleurotoma cantharis* Reeve, 1845, recorded from Pondoland by Sowerby (1900: 5), is a tropical *Clavus* which does not appear to occur in south-eastern Africa. The specimen in question is not present in the Agnes Filmer collection (incorporated into the H. Becker collection, now in NM), which contained a number of such extralimital species with 'Pondoland' labels. However, it is not impossible that the record was based on a worn example of the *albotessellata* form of *Nquma rousi* (Sowerby, 1886).

*Inquisitor* (or *Funa*) *flavidulus* (Lamarck, 1822): Recorded by Barnard (1958: 128, 1966: 604, as *Drillia* and *Turris flavidula* respectively), from off Tongaat in 36 fath., off Durban in 71 m, and from off a *Xenophora* shell from Natal. These specimens cannot now be located in the SAM collection (pers. comm. Mrs M. van der Merwe), other than a radula mount which shows an indeterminate crassispirine. I have seen no examples of the Indo-Pacific *flavidulus* from southern Africa or Mozambique, and assume Barnard's records to be based on specimens of one of my new species, *I. nodicostatus, I. arctatus* or *Funa asra*.

*Turris (Surcula) macella* Melvill, 1923 (= *Surcula macilenta* Melvill, 1923, *non* Solander in Brander, 1766) was originally described from 'South Africa'. The holotype (BM(NH) 1982084, ex E. R. Sykes) is unlike anything known from the South African littoral and the given type locality is thus unlikely. As there remains the slight possibility that it was originally dredged in Cape waters by one of the early expeditions, I give a full description of this, the only known example of the species.

Barnard (1958: 126) initially rejected *macilenta* as a synonym of *Pleurotoma platystoma* Smith, 1877 (in which he was followed by Powell 1969: 226), but

subsequently Barnard (1969: 606) identified as *Drillia macilenta* a shell supposedly from off Hood Point in 49 fathoms. Barnard's specimen (SAM A29765) differs from the holotype of *macella* in its much smaller size (the protoconch for example is less than half the width of that of Melvill's species) and in its stronger shoulder. It is in fact an undescribed *Inquisitor* or *Agladrillia,* also represented by a NM series from various localities off Natal and Transkei (the 'Hood Point' locality is improbable, as I have pointed out under *Funa laterculoides* (Barnard, 1958)); the outer lip is badly broken in all examples available, so description of the species must await better examples.

The holotype of *Turris macella* (Figs 57–58) is immature and lacks adult apertural features. Consequently, its referral to *Agladrillia* is speculative.

*Agladrillia macella* (Melvill, 1923) **comb. n.**

*Surcula macilenta* Melvill, 1923a (*non Murex macilentus* Solander in Brander, 1766): 168, pl. 5, fig. 13. Type locality 'South Africa'.
*Turris (Surcula) macella* Melvill, 1923b: 309 [*nom. subst.*]

Description: Shell narrowly claviform (b/l 0,29, a/l 0,36), 7 teleoconch whorls, early ones gently convex, later ones strongly so, with median, slightly angular periphery, shoulder slope gently concave, no subsutural cord, sutures moderately deep. Aperture narrowly pyriform, greatest width at about posterior third, siphonal canal linear, its end barely notched; columella rather straight, parietal region gently concave, labial callus moderately thick, not forming a parietal pad; labrum immature, anal sinus an open 'U', with apex at middle of shoulder slope.

Sculpture of opisthocline axial ribs, mainly restricted to peripheral area, and close, gently rounded spiral lirae; a terminal varix is apparently just beginning to form. Axial ribs rounded in section, wider than their gently concave intervals, evanescing above shoulder and on body whorl extending slightly below parietal level; 8 feeble ribs on 1st whorl, increasing to 9 on 2nd, and 13 on penultimate whorl. Spiral lirae subequal in strength, except in peripheral region, where slightly wider; feeble on first two whorls, about 11 on 3rd and 22 on penultimate whorl (of which 9 lie on the shoulder slope), about 28 on base of body whorl, those on rostrum not noticeably finer. Colour light yellowish-brown. Dimensions: 17,2 × 5,0 mm.

Protoconch narrowly domed, of 2 smooth, vitreous whorls, with fine close, axial plicules near termination; breadth 1,7 mm, height 1,5 mm (b/h 1,13).

Rejected or doubtful taxa

*Drillia pecus* Barnard (1969: 607, fig. 5b): the holotype, a badly broken, worn, chalky remnant of a shell (SAM A29761), is now so damaged and decomposed that speculation as to identity would be fruitless.

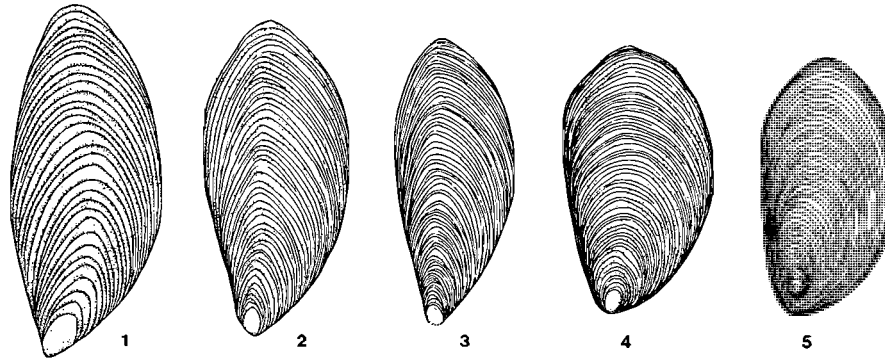
*Drillia neptuni* Turton (1932: 21, pl 4, no 163): three syntypes in OUM (none of which is the figured specimen) are so badly worn as to be unidentifiable.

*Drillia signa* Bartsch (1915: 21, pl. 7, fig. 4): The holotype (USNM 250457) proves to be a teratological *Clavatula* or *Clionella,* in which the whorls become progressively more scalariform with growth (Figs 59–60). Previous whorls are too badly eroded for the normal sculpture and whorl profile to be visible. Geographi-

cally, its most likely identity lies with *Clavatula tripartita* (Weinkauff, 1876), *Clionella rosaria* (Reeve, 1846) or *Clionella subventricosa kaffraria* Kilburn, 1985, but there can be no certainty.

Species transferred to other subfamilies

The genus *Drillia* has been widely applied to southern African Turridae, sometimes to species that are not even clavine. The following species are here transferred to other subfamilies: Subfamily Mangeliinae: *Drillia thetis* E. A. Smith, 1904; *D. collina, D. bruchia, D. tholos, D. latisulcus, D. perfluans, D. oneili, D. morgana, D. diasi, D. armilla, D. spiralis, D. pselia* Barnard, 1958; *D. dovyalis, D. erepta* Barnard, 1969; *D. dolorosa, D. lea* Thiele, 1925; *D. pretiosa, D. albanyana, D. simplex* Turton, 1932; *Haedropleura thea* Thiele, 1925. Subfamily Borsoniinae (see Kilburn 1986): *Pleurotoma (Drillia) scitecostata, P. (D) fossata* Sowerby, 1903, *D. simplicingula, D. pleonastica* Barnard, 1958. Subfamily Clavatulinae: *D. subcontracta* E. A. Smith, 1904 (see Kilburn 1985); *D. signa* Bartsch, 1915 (see above).




Figs 1–5. Opercula of some Crassispirinae and Drilliinae (not drawn to scale). **1**, *Haedropleura summa* sp. n.; **2**, *Calcatodrillia chamaeleon* sp. n.; **3.**, *Naudedrillia praetermissa* (Smith, 1904); **4**, *Turridrupa cincta* (Lamarck, 1822); **5**, *Clavus unizonalis* (Lamarck, 1822).

**Subfamily DRILLIINAE Morrison, 1966**

Diagnosis: Shell claviform; operculum oblanceolate, with terminal nucleus. Radula formula 1–1–R–1–1 (rarely 1–1–0–1–1); rachidians small to absent, laterals broad, arched and pectinate; marginals long, solid, sharply pointed. Poison gland, pressure bulb and oral tube present, odontophore large.

Notes: Cernohorsky (1985: 60) showed that the subfamily name Clavinae Casey, 1904, was a homonym of Clavinae McCrady, 1859, in the Hydrozoa.

Key to genera of Drilliinae in southern Africa and Mozambique

1 Outer lip pinched in towards base ..... **Agladrillia**
— Outer lip not pinched in towards base ..... 2
2 Axial rib suture-to-suture ..... 3
— Axial ribs evanescing below suture ..... 5

3 Protoconch conical, of 2½–4 whorls ..... **Iredalea**
— Protoconch narrowly domed, of 1½–2½ whorls ..... 4
4 Whorls with concave shoulder slope, spiral lirae fine to absent; rachidian present ..... **Tylotiella**
— Whorls not concave posteriorly, spiral lirae absent (except sometimes on rostrum); rachidian absent ..... **Orrmaesia**
5 Anal sinus spout-like ..... **Drillia**
— Anal sinus not spout-like ..... 6
6 With sharply incised spiral grooves, cutting axial ribs into nodules or granules **Acinodrillia**
— Spiral sculpture absent or of raised threads ..... 7
7 Spiral lirae absent or restricted to rostrum; shoulder not nodose or spinose **Splendrillia**
— Spiral lirae overall; shoulder usually nodose to spinose ..... **Clavus**

## *Drillia* Gray, 1838

*Drillia* Gray, 1838: 28. Type species (s.d. Gray, 1847) *Drillia umbilicata* Gray, 1838.

Diagnosis: Shell claviform, medium-sized, siphonal canal short, deeply notched, fasciole often strong, usually with false umbilicus; anal sinus moderately deep, U-shaped, spout-like, usually projecting, constricted by large parietal pad; labrum rather straight, with shallow to deep stromboid notch, usually preceded by varicoid rib; axial ribs strong, spiral sculpture varying from coarse to absent, subsutural cord weak to absent. Protoconch of 2–3 smooth whorls, initial one small and immersed. Operculum oblanceolate, with terminal nucleus. Radula with small unicuspidate rachidian, laterals strongly arched, marginals with short blade.

Notes: As noted in the introduction, '*Drillia*' has been widely (indeed routinely) used as a portmanteau genus for practically any clavine turrid (and occasionally for non-clavines as well). However, only one southern African species (*connelli*) is known by its radular characters to be an undoubted *Drillia*. Three further species are referred here (pending confirmation) on shell characters, although it should be noted that none of these (with one occasional exception) possesses a prelabral varix and the stromboid notch is feeble, unlike typical *Drillia* species. The exception mentioned is the narrow form (Fig. 72) of *Drillia spirostachys*, a species which in fact displays general shell characters that agree remarkably well with those of *Mangelia immaculatus* Tenison-Woods, 1876, type species of *Paracuneus* Laseron, 1954. Yet, broad examples of *spirostachys* are not dissimilar in general form to *Drillia lignaria* Sowerby, 1903, which is a fairly typical *Drillia*. Clearly these taxa require further investigation.

### Key to subgenera of *Drillia*

Spiral sculpture fine or absent ..... **Drillia**
Spiral sculpture strong ..... **Clathrodrillia**

### Subgenus *Drillia s.s.*

Diagnosis: Spiral sculpture weak or absent.

Key to species of *Drillia s.s.* in southern Africa

1 Parietal tubercle strong, constricting anal sinus; outer lip not foreshortened basally; axial ribs not tubercle-like; brown with pale speckles, or salmon-pink; apex not papilliform, protoconch breadth 1,20–1,30 mm (b/h 0,88-1,04) **caffra**

— Parietal tubercle weak, not constricting anal sinus; outer lip more or less foreshortened; axial ribs tubercle-like, pale on a brown ground; protoconch smaller (breadth 0,95–1,20 mm) and proportionally narrower (b/h 0,77–0,89) ..... 2

2 Outer lip only slightly foreshortened; body whorl obconical, strongly shouldered, apex papilliform, siphonal canal only slightly notched terminally; ribs strong, reaching lower suture, 10 on penultimate whorl ..... **lignaria**

— Outer lip markedly foreshortened; body whorl oblong, weakly shouldered, apex not papilliform, siphonal canal relatively deeply indented; ribs reduced to small nodules, not reaching lower suture, 10–12 on penultimate whorl **spirostachys**

## *Drillia (Drillia) caffra* (E. A. Smith, 1882)

Figs 62–66

*Pleurotoma (Clavus) caffra* Smith, 1882: 209. Type locality 'South Africa' [here restricted to East London].
*Pleurotoma caffra*; Sowerby, 1886: 5.
*Pleurotoma (Clionella) caffra*; Sowerby, 1892: 6, pl. 4, fig. 80.
*Drillia caffra*; Smith, 1904: 22; Bartsch, 1915: 21; Turton, 1932: 20; [partim] Barnard, 1958: 124, (? fig. 11c).
*Clionella caffra*; Tomlin, 1931: 440.
*Drillia nivosa* E. A. Smith, 1904: 27, pl. 2, fig. 5; Turton, 1932: 20. Type locality: Port Alfred.
*Drillia nereia* Turton, 1932: 21, pl. 4, no 160 (**syn. n.**). Type locality: Port Alfred.

Diagnosis: Shell with apex neither very acute nor papilliform, b/l 0,36–0,44, a/l 0,33–0,42, body whorl somewhat oblong-obconical, aperture rather large, whorls shouldered, with periphery at or above middle, subsutural cord very feeble; axial ribs short but not tubercle-like, 10–15 on penultimate whorl, crossed by very fine spiral threads; labrum not foreshortened, parietal nodule strong, constricting anal sinus; salmon-pink, or light to deep brown, speckled with off-white; protoconch breadth 1,20–1,30 mm, b/h 0,88–1,04; attains 23,7 mm.

Description: Shell claviform (b/l 0,36–0,44, a/l 0,33–0,42), spire somewhat cyrtoconic, apex moderately acute and orthoconic. Teleoconch whorls numbering up to 6, first 1–2 weakly convex, remainder with rounded shoulder, situated a quarter- to half-whorl below suture where it usually forms the periphery; shoulder slope shallowly concave, subsutural cord not developed; left side of base of body whorl concave, with a well-developed fasciole, sometimes with a chink-like false umbilicus next to columella callus. Aperture oblong-lanceolate, greatest width more or less median, siphonal canal wide, not bent to right, its termination well indented dorsally; columella straight to slightly convex, labial callus thick, its outer edge slightly free on columella, parietal pad large, wedge-shaped, constricting entrance to anal sinus; labrum very gently convex in side-view, with very shallow stromboid notch, anal sinus deep, U-shaped, bordered by weakly alate expansion of lip.

Sculptured by short, rather low axial ribs and very fine spiral threads; no prelabral varix. Axial ribs opisthocline, straight, terminating at shoulder (where they form weak nodules), and on body whorl at level of parietal tubercle; crests rounded, with gradually sloping sides; 11–14 on 1st whorl, 10–15 on penultimate whorl, 12–18 on last one. Spiral threads very fine and dense, covering entire outer surface, uniform in strength except on rostrum where somewhat coarser.

Two geographic colour morphs: *(a)* Western form: light orange (rarely strong orange), base and immediate subsutural region paler, suture bordered by a row of small brown flecks; *(b)* Eastern form: light or moderate brown to brownish-orange, heavily flecked with yellowish-white, forming a series of pale shoulder spots on ribs, and sometimes arranged in broken spiral lines or axial zigzags.

Dimensions: 23,7 × 8,5 mm, 14,0 × 6,1 mm (largest and smallest adult respectively).

Protoconch bluntly conical (rarely slightly papilliform), of about 2 whorls, the initial one depressed; smooth except for weak axial riblets and faint spiral threads near termination, lip reversed sigmoid; breadth 1,20–1,30 mm, height 1,05–1,30 mm (b/h 0,88–1,04).

Operculum and soft parts unknown.

Range: Jeffreys Bay to eastern Transkei, littoral to 90 m.

Locality data (all NM): EASTERN CAPE: Jeffreys Bay, beach (4401: R. K.; B748: E. K. Jordan; B6831: Mrs F. C. Graham; 6688: W. Falcon), 25 m, dead on sand (D4379: A. Connell); Algoa Bay (B2970: S. Rous; 626: J. Crawford; 6690: W. Falcon; B6594: ex Albany Mus.); Port Alfred (B3239: E. K. Jordan; B1891: R. K.; 6692: H. Becker); East London (A2020, A628: R. K.; A2824: Mrs C. Connolly; 3213: M. Lavertine); Kwelera (A2826: Mrs C. Connolly; A562: Mrs V. Armstrong); Bulugha (B2266: B. J. Young); off Gonubie, 30 m, sponges, soft corals, gorgonians, dead (B8509: *MN*). TRANSKEI: off Kei River mouth, 55 m, coarse sand, mud, dead (C5143: *MN*); Dwesa (C6050: R. K.); Qolora River mouth (C3595: R. K.); off Sandy Point, 90 m, calcareous debris, dead (C4503: *MN*); off Qora River, 45 m, coarse sand, numerous pagurids, dead (C4006: *MN*); off Mncwasa Point, 32–35 m, fine sand, dead (C2704: *MN*); Lwandile/Mdumbi (C 181: R. K., R. Fregona); Pressley Bay (5924: R. K.); Mbotyi (C8181: R. K., D. Herbert).

Type material: The holotype of *Pleurotoma caffra* is BM(NH) 1851.11.17.51; holotype of *Drillia nivosa* also in BM(NH); three syntypes of *D. nereia* in OUM.

Notes: This species is rare in an unworn state, and living examples are unknown to me. It displays marked geographic variation (perhaps deserving of subspecies status): all examples from Jeffreys Bay and Algoa Bay (Figs 61–64) are salmon-pink (save for an occasional yellowish shell), larger and relatively narrower (b/l 0,36–0,42), with axial ribs generally narrower than their intervals. In contrast (Figs 65–66) the typical form, which occurs from Port Alfred eastwards, is smaller (up to 16,0 mm), broader and squatter (b/l 0,43–0,44), brown with pale flecks, and axial ribs that are wider than their intervals.

Both Tomlin and Barnard confused *Drillia caffra* with *Naudedrillia praetermissa*. Although similar in general appearance, the distinctly notched siphonal canal and spout-like anal sinus of *D. caffra* readily separate them.

*Drillia (Drillia) lignaria* (Sowerby, 1903) **comb. n.**

Figs 67–69

*Pleurotoma (Clavus) lignaria* Sowerby, 1903: 215, pl. 3, fig. 4. Type locality: 25 mi. off Lion's Head [west coast Cape Peninsula], 136 fath.
*Turris lignaria*; Barnard, 1958: 102.
*Drillia distincta* Thiele, 1925: 212 (178), pl. 35 (23), fig. 17. *syn. n.* Type locality: 34°08'S, 24°59'E [off St Francis Bay], 80–100 m.
*Drillia castanea* (*non* Reeve, 1845); von Martens, 1904: 23.
*Drillia platystoma* [*partim non* Smith, 1877]; Barnard, 1958: 125.

Diagnosis: Shell with obconic body whorl and acute, papilliform apex, b/l 0,35–0,42, a/l 0,32–0,38, whorls shouldered, with periphery below middle; shoulder slope moderately concave, subsutural cord weak but distinct; axial ribs tubercle-like but reaching lower suture, 10 on penultimate whorl, crossed by very fine spiral threads; labrum not foreshortened, siphonal canal shallowly indented, parietal tubercle moderately large but not constricting anal sinus; brown with paler axial ribs; protoconch breadth 1,00–1,10 mm; attains 25,9 mm.

Description: Shell claviform (b/l 0,35–0,42, a/l 0,32–0,38), body whorl obconical, spire acute, apex papilliform, teleoconch whorls about 7½; first 2–3 whorls weakly convex, rest with rounded shoulder situated at about midwhorl, periphery of whorl at about anterior third, shoulder slope moderately concave with a slight subsutural cord; left side of base of body whorl concave with well-developed fasciole and sometimes a chink-like umbilicus next to columella callus. Aperture oblong-lanceolate, greatest width more or less median, siphonal canal moderately wide, bent slightly to right, its termination shallowly indented dorsally; columella straight to slightly convex, labial callus thick, its outer edge slightly free on columella, parietal pad small to moderate, not constricting entrance to anal sinus; labrum very gently convex in side-view, with very shallow stromboid notch, anal sinus deep, U-shaped, bordered by weakly alate expansion of lip.

Sculptured by tubercle-like axial ribs and very fine spiral threads; growth-lines coarse, an occasional one very coarse. Axial ribs feeble on 1st whorl, on 2nd forming 8–10 low axial nodules above suture; penultimate whorl with 10 ribs, body whorl with 8–9 (obsolete immediately behind lip); crests rounded in section, with gradually sloping sides, opisthocline, equal to intervals, evanescing above shoulder and on body whorl at level of parietal tubercle. Spiral threads feeble on early whorls, on later ones fine, close and uniform, except above shoulder where weaker, and on base of body whorl where wider than elsewhere.

Colour light brown to moderate orange, with paler axial ribs and rostrum.

Dimensions: 25,9 × 10,0 mm, 15,2 × 5,9 mm (largest and smallest examples examined).

Protoconch narrowly pupoid-conical, of about 2⅓ whorls, first half-whorl small and depressed, 2nd slightly more convex than last whorl; evidently smooth, except for sinuous growth-lines near termination; lip strongly reversed-sigmoid; breadth 1,00–1,10 mm, height 1,25–1,40 mm (b/h 0,78–0,81).

Operculum, radula and soft parts unknown.

Range: Continental shelf from Atlantic coast of Cape Peninsula to off Tsitsikamma coast, in about 80–250 m.

Locality data (see also type localities): AGULHAS BANK: off Cape Infanta,

125 m (NM B5524: W. Liltved); off Cape St Blaise, *ex pisce* (NM A4056, B4040, A2904: R. le Maitre).

Type material: One syntype of *P. lignaria* in BM(NH) 1903.7.27.52 (labelled 'holotype'), another syntype is SAM A357 (called 'paratype'). Former (Fig. 67), dimensions 22,1 × 8,6 mm, lip broken, is here designated as lectotype. Syntypes of *D. distincta* presumably in ZMB.

Notes: Judging by the quantity of *ex pisce* material available, *D. lignaria* is an abundant and characteristic Agulhas Bank species. I doubt whether the broken shell (SAM A8682) from 32 fathoms in False Bay, referred here by Barnard, is in fact conspecific. It differs slightly in shape, has a stronger subsutural cord and spiral lirae and the axial ribs extend further onto the base of the body whorl.

Syntypes of *lignaria* agree well with the type figure of *D. distincta,* which was inexplicably referred by Barnard *(loc. cit.)* to the very different *'Drillia' platystoma.* Similarly, I can find no resemblance between the present species and the holotype of *Pleurotoma castanea* Reeve, 1845 (Fig. 183) to which Von Martens referred the *Valdivia* examples.

**Drillia (Drillia) spirostachys** sp. n.
Figs 70–72

*Drillia platystoma* (non Smith, 1877); Barnard, 1969: 605.

Diagnosis: Shell with oblong body whorl and acute, non-papilliform apex, b/l 0,31–0,35, a/l 0,32–0,35; whorls with angular to shouldered periphery, situated at or just below middle; shoulder slope shallowly concave, subsutural cord weak or absent; axial ribs tubercle-like, more or less peripheral, seldom reaching lower suture, 10–12 on penultimate whorl, crossed by very fine spiral threads; labrum foreshortened, siphonal canal fairly deeply and obliquely notched; parietal tubercle relatively weak, not constricting anal sinus; brown with pale to white nodules; protoconch breadth 0,95–1,20 mm; attains 19,8 mm.

Description: Shell narrowly claviform (b/l 0,31–0,35, a/l 0,32–0,35, body whorl rather oblong, spire acute, apex not papilliform, teleoconch whorls about 7; first 2–3 whorls weakly convex, rest with a rounded peripheral angle situated at or just below midwhorl, forming a weak shoulder on last whorl or two, shoulder slope shallowly concave with at most a slight subsutural cord; left side of base of body whorl concave with a well-developed fasciole and usually a chink-like umbilicus next to columella callus. Aperture narrowly oblong-lanceolate, rather linear, but greatest width more or less median, labrum markedly foreshortened, rendering base oblique, siphonal canal moderately wide, bent slightly to right, its termination rather deeply indented dorsally; columella straight or slightly convex, labial callus thick, its outer edge slightly free on columella, parietal pad small to moderate, not constricting entrance to anal sinus; labrum very gently convex in side-view, with shallow but distinct stromboid notch, anal sinus deep, U-shaped, bordered by weakly alate expansion of lip.

Sculptured by rather low, largely peripheral, tubercle-like axial ribs (sometimes almost obsolete on later whorls) and very fine spiral threads; growth-lines coarse, an occasional one very coarse; a weak prelabral varix sometimes present in narrow

examples. Axial ribs feeble on 1st whorl, on 2nd forming 10–11 low axial nodules above suture; penultimate whorl with 10–12 ribs, body whorl with 12–15 (becoming weak immediately behind lip); crests rounded in section, with gradually sloping sides, opisthocline, equal to intervals, evanescing abruptly above shoulder, seldom reaching suture below, and on body whorl becoming obsolete above suture-line or at least by level of parietal tubercle. Spiral threads feeble on early whorls, on later ones fine, close and uniform, about 29–38 on penultimate whorl, often weak on shoulder slope, on base of body whorl wider and more close-set than elsewhere.

Colour light to deep brown, tubercles usually paler to yellowish-white at periphery.

Dimensions: 17,2 × 5,8 mm (holotype); 19,8 × 6,2 mm, 14,5 × 5,0 mm (largest and smallest paratypes).

Protoconch narrowly pupoid-conical, of slightly more than 2 whorls, first half-whorl small and depressed; smooth, except for sinuous growth-lines and about 8 feeble spiral threads near termination; lip strongly reversed-sigmoid; breadth 0,95–1,20 mm, height 1,15–1,35 mm (b/h 0,77–0,89).

Operculum oblanceolate, with sharp apex, growth-lines coarse, translucent yellowish.

Body greyish-white, speckled with black. Tentacles consisting mainly of a basal lobe bearing the eye, with only a short digitiform tip. No radula located.

Range: Continental shelf from Natal to East London, 60–300 m.

Type material: Holotype NM D1506/T3713, off Umlaas Canal, south of Durban (approximately 30°00′S, 31°00′E), 73 fathoms; dredged A. Connell. Paratypes 1–2, NM D4156/T3626, off Durban, 150 m, sandstone gravel, some sponge. Paratypes 3–4, NM D4216/T3627, off Durban, 130 m, sandstone gravel, some rocks. Paratype 5, NM D3824/T3633, off Durban, 110–120 m, coarse muddy sand. Paratype 6, NM D1622/T3630, off Umlaas Canal, 150 m, coarse sand, pebbles, numerous spatangoids. Paratypes 7–8. NM D816/T3714, same data. Paratype 9, NM C1171/T3634, off Port Grosvenor, Transkei, 120–128 m, coarse sand, some mud, solitary coral, shells. Paratype 10, NM C6541/T3629, off Mendu Point, Transkei, 300 m, coarse sand. Paratype 11, NM B7883/T3628, off Bonza Bay, just east of East London, 60 m, sandy mud. Paratypes 15–16, NM B8444/T3631, off East London, 50 m, grey muddy sand, worm tubes, ophiuroids. All paratypes dredged *MN*.

Notes: Broad examples of *Drillia spirostachys* are somewhat similar to narrow examples of *D. lignaria*, and it is not impossible that the former may prove to be an eastern subspecies of *lignaria*. However, *spirostachys* appears to be always distinguishable from *lignaria* by its somewhat narrower form, more elongate body whorl, foreshortened outer lip, slightly narrower and more linear aperture, deeper siphonal notch and slightly more numerous, discretely tuberculate (occasionally almost obsolete) axials.

As indicated in the introduction, narrow examples of *D. spirostachys* resemble *Paracuneus immaculatus* (Tenison-Woods, 1876), the type species of *Paracuneus*, in shape and general sculpture.

The SAM specimens (A1723 from off Cape Vidal, 80–100 fath., and A8705, supposedly from off Hood Point, 49 fath.) recorded by Barnard (1969) as *Drillia platystoma* are in poor state but appear to be referable to *spirostachys* (although they are excluded from the types). The Zululand locality is probable, but the Hood Point P.F. station, although within the range, appears to have been frequently if not consistently the result of mislabelling.

Etymology: The cream nodules on a brown ground are suggestive of the contrasting colours in the wood of the tamboti tree (*Spirostachys africana* Sond.).

Subgenus *Clathrodrillia* Dall, 1918

*Clathrodrillia* Dall, 1918: 323. Type species (o.d.) *Pleurotoma gibbosa* Born, 1778.

Diagnosis: Spiral lirae nearly as strong as axial ribs.

**Drillia (Clathrodrillia) connelli** sp. n.
Figs 6, 12, 57–58

Diagnosis: Shell with b/l 0,36–0,42, a/l 0,36–0,39, base bent strongly to right, labrum strongly alate below anal sinus, false umbilicus distinct; subsutural cord weak, not nodular, shoulder sulcus shallow, crossed by axial ribs; ribs strong, extending to suture and to rostrum, strongly opisthocline, 17–19 on penultimate whorl, crossed by thin, low spiral lirae, 6–8 widely spaced lirae on penultimate whorl plus 4–6 closer ones below suture; cream, with median zone of dull brown on body whorl; protoconch breadth 0,80–0,85 mm. Attains 35 mm.

Description: Shell claviform (b/l 0,36–0,42, a/l 0,36–0,39), base moderately long, tapering and bent slightly to right, labrum with alate shoulder expansion, rendering anal sinus spout-like; teleoconch whorls about 9, suture moderately deep, whorls posteriorly evenly convex, periphery at basal third of each whorl; subsutural quarter of each whorl impressed, raised at suture to form a weak subsutural cord, with a shallow, evenly concave shoulder sulcus, left side of base of body whorl concave with a strong fasciole and distinct false umbilicus. Aperture narrowly pyriform with flattened labrum, slightly convex columella and a concave parietal region, siphonal canal wide, parallel-sided, not indented, labial callus thick with free outer edge and thick parietal pad which constricts anal sinus; labrum gently convex in side-view, with wide stromboid notch and deep, U-shaped, subtubular anal sinus, whose opening is slightly constricted, its margin somewhat flaring and reflexed.

Sculptured by strong axial ribs, crossed by low, thin spiral lirae; growth-lines very fine; labrum preceded by a strong varix, about one-fifth whorl back from lip. Axial ribs strongly opisthocline, arcuately recurved below suture, approximately half-width of their intervals, suture-to-suture, but weaker below suture on later whorls, extending onto rostrum, crests bluntly angular, slightly reflexed, with steeply sloping sides; 9–10 ribs on 1st whorl, 17–19 on penultimate one, 18–20 (including varix) on body whorl, irregular behind lip. Spiral lirae weak and rounded, faint on 1st whorl; penultimate whorl with 6–8 wide-set lirae anteriorly, and 4–6 closer ones on subsutural cord and depression; base of body whorl with 12–15 lirae, particularly widely spaced on rostrum.

Yellowish-white with obscure spiral zones of light to moderate brown, one zone below suture, one at mid-body whorl, rarely with a moderate brown median zone on body whorl; dorsum of body whorl sometimes tinged with brown; aperture, labial callus and protoconch white.

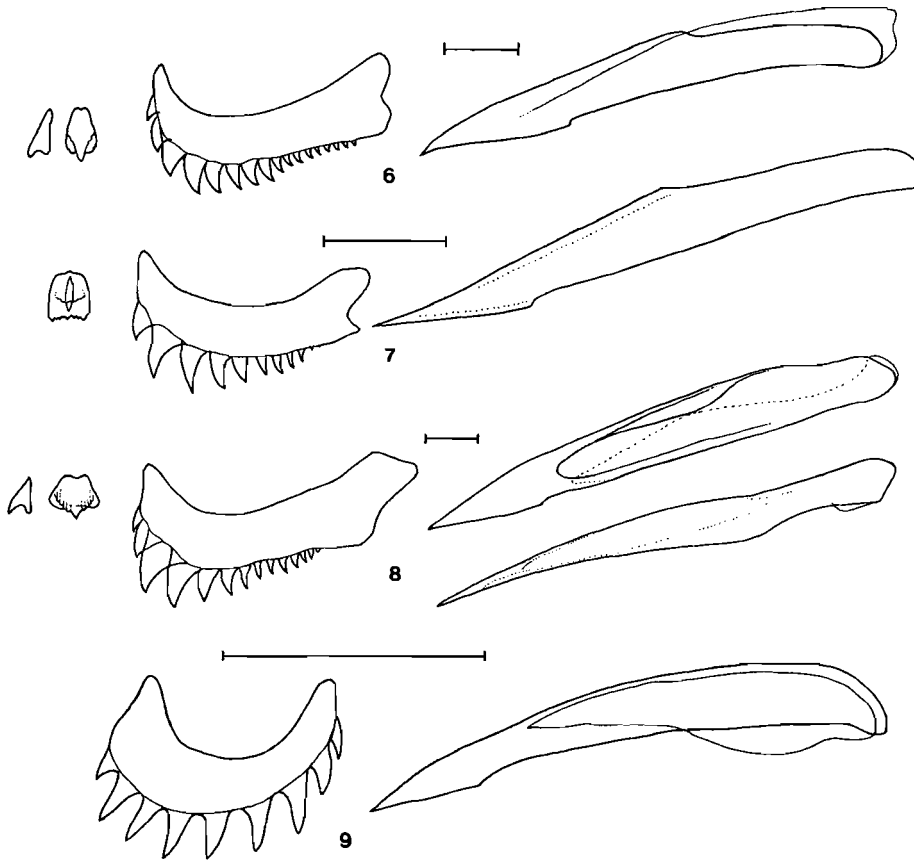
Protoconch narrowly domed, of 1½ whorls; 1st half-whorl slightly tilted; smooth except for a series of fine, close axial plicules at termination; breadth 0,80–0,85 mm, height 0,63–0,68 mm (b/h 1,25–1,27).

Dimensions: 29,1 × 11,2 mm (holotype); 34,9 × 13,0 mm, 22,4 × 8,5 mm (largest and smallest paratype respectively).

Operculum relatively thick, oblanceolate with subterminal, eccentric nucleus; moderate brown.

Tentacles digitiform, with eyes on a lobe occupying basal half to two-thirds of tentacle length, eyes often lightly pigmented; penis long, compressed, tip fairly blunt, without a papilla.

Radula (Fig. 6): Rachidian plate narrow, unicuspidate, lateral relatively straight, cusps about 17 in number, strong on inner side, becoming progressively finer, then




Figs 6–9. Radulae of some Drilliinae. **6**, *Drillia (Clathrodrillia) connelli* sp. n.; **7**, *Tylotiella basipunctata* sp. n.; **8**, *Clavus unizonalis* (Lamarck, 1822); **9**, *Orrmaesia dorsicosta* sp. n. Scale-line = 0,05 mm.

evanescing on outer side; marginals slightly arched, blade occupying less than a third of the tooth length; about 40 rows of teeth.

Range: Continental shelf of Zululand and Natal, 75–117 m.

Type material: Holotype NM D4522/T3686, off Durnford Point, Zululand (29°05,2'S, 32°08,6'E), 112 m, dredged A. Connell. ZULULAND: Paratypes 1–14, off Durnford Point, dredged A. Connell: paratypes 1–5, NM D1517/T3707, 100 m; paratype 6, NM B6311/T3708, 100 m; paratypes 7–8, NM D1573/T3709, 110 m, muddy sand; paratype 9, NM D1549/T3685, 110 m, muddy sand, radula slide M200; paratype 10, NM D4491/T3683, 117 m; paratypes 11–14, NM D4514/T3761, 115 m. Paratypes 15–19, NM D8010/T3932, off Durnford Point, 114 m, sandstone rubble, *MN*. Paratype 20, NM D6642/T3933, off Gobey's Point, 55–100 m, sand, shell-rubble, *MN*. NATAL: Paratype 21, NM D3534/T3684, off Durban, 75 m, sandy mud with shell-rubble, dredged *MN*.

Notes: Very similar to *Drillia tasconium* Melvill & Standen, 1901, from the Gulf of Oman, but, according to three syntypes (NMW 1955.158.509), that has a shoulder sulcus which cuts through the ribs, a nodular subsutural cord and less oblique axial ribs. Curiously, Powell (1966: text fig. D103) figures a crassispirine radula for *'Crassispira tasconium'*. Equally similar is *D. (C.) salvadorica* (Hertlein & Strong, 1957) of central West America, which has spiral grooves that incise the axial ribs.

Etymology: Named in honour of Dr Allan Connell of the CSIR (Water Research), discoverer of this and several other new species.

## *Clavus* Montfort, 1810

*Clavus* Montfort, 1810: 435. Type species (o.d.) *Clavus flammulatus* Montfort, 1810.

Diagnosis: Shell medium-sized (10–45 mm), claviform (sometimes broadly so), often thick-shelled, base truncate; anal sinus U-shaped, usually rather shallow, not spout-like, stromboid notch shallow to deep; sculptured by strong axial ribs which do not reach the suture and which (typically) develop peripheral angles, nodules or even squamose spines; spiral lirae fine to feeble; usually vividly patterned with brown. Protoconch domed, of about 2 smooth whorls. Operculum oblanceolate, with terminal nucleus. Radula drilliine, rachidian small, unicuspidate (sometimes with tiny side-cusps), laterals arched, pectinate, marginals somewhat awl-shaped, with weak blade and accessory limb.

Notes: The type species of *Clavus*, *C. flammulatus*, is aberrant in that it appears to retain somewhat immature apertural features as an adult. Within the genus there is a transformation sequence from the prominently spinose character-state found in species such as *canicularis* (Röding, 1798), through those with sharp angles (e g *exasperatus* (Reeve, 1843), *wilmeri* (Smith, 1875)) to a state in which the shoulder bears only blunt tubercles (e g *sikesi* Preston, 1908, *rugizonatus* Hervier, 1895) or even sometimes none at all (*unizonalis* (Lamarck, 1822)). Some of the species listed under *Clavus* by Powell (1966) would be better placed in *Tylotiella*.

Powell's figures (1966: text fig. D84–85) of the radulae of two *Clavus* species show a definite accessory limb; in the example of *C. unizonalis* examined here, accessory limbs appear to be present, but are very flimsy.

*Clavus* is a tropical genus, not known further south than the coral coast of northern Mozambique.

Key to Mozambican species of *Clavus*

Dark median zone bordered posteriorly by an interrupted brown line ..... **groschi**
Dark median zone not bordered posteriorly by such a line ..... **unizonalis**

*Clavus unizonalis* (Lamarck, 1822)

Figs 5, 8, 75–77

*Pleurotoma unizonalis* Lamarck, 1822: 92; Kiener, 1840: 54. pl. 22, fig. 2; Deshayes, 1843: 347; Reeve, 1843; pl. 13, fig. 113. Type locality unknown.
*Drillia (Clavus) auriculifera* var. *unizonalis*; Bouge & Dautzenberg, 1914: 136.
*Drillia (Tylotia) unizonalis*; Melvill, 1917: 161.
*Tylotia unizonalis*; Habe & Kosuge, 1970: 95, pl. 38, fig. 3.

Range: New Caledonia and Japan to northern Mozambique.

Regional locality data: NORTHERN MOZAMBIQUE: Quisiva Island, Quirimba Archipelago, clinging to side of rock outcrop on reef flats, LST (NM K332: R. K.).

Notes: The single Mozambican specimen (Figs 75–76) agrees well with NM shells from Papua New Guinea (Fig. 77), Solomon Islands and Queensland, except for its columella being white, not dark brown. It is further atypical in the dark median zone being grey rather than the normal blackish-brown, although a Queensland individual is similar in this respect. The only other Indian Ocean record that I can trace is Melvill's doubtful 1917 report from the Persian Gulf.

The following notes are based on the Quisiva specimen: Radula (Fig. 8): rachidian plates small but relatively broad in front, narrowed behind, with strong median cusp and fine side-denticles; laterals moderately straight, with 15–16 cusps, those on inner side strong, becoming weak towards outer side, where they evanesce; marginal plates sharp, blade short, shaft partly hollowed out (see figure), accessory limb diaphanous; about 33 rows of teeth.

Tentacles short, blunt, eyes large, on large basal lobe; soft parts flesh-coloured, with fine black speckling. Operculum (Fig. 5) a mirror-image of that figured by Hedley (1922: pl. 45, fig. 51) for *Clavus vidualoides* (Garrett, 1873), but nucleus subterminal.

**Clavus groschi** sp. n.

Figs 78–79

Diagnosis: Shell with b/l about 0,42, a/l about 0,33, whorls with a weakly angulate shoulder (not spinose or prickly); subsutural region not swollen; axial ribs strong, 10 on penultimate whorl, rib behind lip varicoid; rostrum with about 6 spiral lirae, body whorl with two rows of very feeble granules at parietal level, but no vermiculate riblets; microsculpture of pliculate growth-lines and exceedingly fine spiral striae; cream with a light brown spiral band, bordered above by a broken brown line; attains 22,8 mm.

Description: Shell claviform (b/l about 0,42, a/l about 0,33), with relatively short, oblique base, suture shallow, each whorl rising high up its predecessor; 8 teleo-

conch whorls; each whorl with angular (but not spinose) shoulder, its periphery below median, posteriorly only slightly concave, without subsutural cord or sulcus, left side of base of body whorl concave, with moderately strong fasciole and slight false umbilicus. Aperture oblong, greatest width at posterior third, with relatively narrow, short siphonal canal, whose termination is moderately obliquely indented; columella slightly convex, parietal region concave; labial callus thick, forming a parietal pad which constricts anal sinus, labrum gently convex, with a shallow stromboid notch and rather shallow, openly and asymmetrically U-shaped anal sinus, which is somewhat adapically directed.

Sculptured by short axial ribs, rostrum with about 6 spiral lirae; a strong varicoid rib behind lip; two rows of small, very feeble granules on body whorl at parietal level (lower edge of brown zone); microsculpture of pliculate growth-lines and exceedingly fine spiral striae, visible mainly below suture. Axial ribs narrower than their intervals, opisthocline, initially suture-to-suture, but after about 3rd whorl begin to evanesce on upper half of each whorl; on body whorl ribs become obsolete at level of columella/parietal junction; crest of each rib angular, with gradually sloping sides; 7 ribs on 1st whorl, 10 on penultimate one.

Yellowish-white, with a light brown (reddish-grey in a worn paratype) spiral band below periphery of body whorl (at about level of parietal nodule), bordered posteriorly by a line of strong brown dashes (interrupted by the ribs); labium white.

Dimensions: 22,8 × 9,5 mm (holotype).

Protoconch, operculum, radula and soft parts unknown.

Range: Littoral of northern Mozambique.

Type material: Holotype NM G3034/T3583, Conducia Bay (14°56'S, 40°41'E), K. Grosch. Paratopotype NM H5518/T3584, K. Grosch, a worn shell.

Notes: Closely allied to several Indo-Pacific *Clavus* spp, notably *C. exasperatus* (Reeve, 1843) which, however, has distinctly spinose peripheral nodules and conspicuous vermiculate axial threads below the periphery of the last whorl. *C. sikesi* (Preston, 1908) has fewer, stronger ribs, which project far more at the shoulder. *C. pulchellus* (Reeve, 1845) has stronger, less oblique axial ribs. *C. paroeca* (Melvill, 1923) from unknown locality (a juvenile from Brunei (NM K1486) has been received from J. Drivas), has a tumid subsutural region.

Etymology: Named in honour of its collector, Mr Kurt J. Grosch, who has contributed much to our knowledge of the molluscs of Mozambique.

## *Iredalea* Oliver, 1915

*Iredalea* Oliver, 1915: 538. Type species (o.d.) *I. subtropicalis* Oliver, 1915.

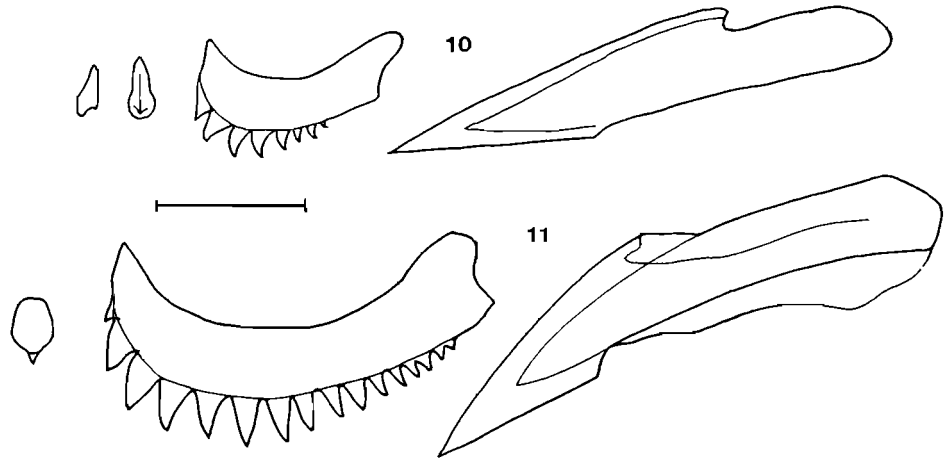
Diagnosis: Shell resembling *Tylotiella*, but protoconch narrowly conical, of 3½–4 whorls; spiral microstriae faint or absent. Radula drilliine, resembling that of *Clavus*, but marginal plate shaped like a carving-knife (Fig. 10), with its blade prominent and 'heeled', occupying nearly two-thirds of length of tooth.

Notes: In shell characters, *Iredalea* is not readily separable from *Crassopleura* Monterosato, 1884, from the Mediterranean. (The protoconch of the type species, *Pleurotoma maravignae* Bivona, 1838, was figured by Bernasconi & Robba (1984:

pl. 2, fig. 1) as *Pleurotoma incrassata* Dujardin, 1837, *non* Sowerby, 1834). The radula of a specimen of *C. maravignae* from the Mediterranean coast of France, kindly made available by Dr P. Arnaud, is certainly drilliine, but differs from that of *Iredalea exilis* (Pease, 1868) in its peculiarly bent marginal plates (Fig. 11), the blades of which resemble those of *Clavus* in extent. The significance of this difference must remain uncertain until more data on members of the complex are available, but for the present *Iredalea* is recognised as a valid genus.

Key to species of *Iredalea* in southern Africa and Mozambique

Shell small (8 mm or less); 15–22 axial ribs on later whorls..... **exilis**
Shell moderately large (adult length 17–24 mm); 12–15 ribs on later whorls **inclinata**




Figs 10–11. Radulae of some *Iredalea* and *Crassopleura* spp. **10**, *Iredalea exilis* (Pease, 1868); **11**, *Crassopleura maravignae* (Bivona, 1838), Bay of Cassis, France, 50 m. Scale-line = 0,05 mm.

*Iredalea exilis* (Pease, 1868) **comb. n.**

Figs 10, 15, 80–84

*Drillia exilis* Pease, 1868: 220, pl. 15, fig. 19; Tryon, 1884: 206, pl. 15, fig. 25, pl. 12, fig. 32. Type locality: Tahiti.
*Drillia pusilla* Garrett, 1873: 219, pl. 2, fig. 31; Bouge & Dautzenberg, 1914: 134; Dautzenberg, 1929: 367 (161). Type locality (here restricted): Viti [= Fiji] Is.
*Iredalea pygmaea* (*non* Dunker, 1860); Maes, 1967: 142, pl. 15, fig. G.

Diagnosis (regional material): Shell pupoid-claviform. b/l 0,35–0,39 (excluding protoconch), axial ribs suture-to-suture, 15–22 on later whorls, usually impressed below suture, base with about 6 spiral lirae, anal sinus moderately deep; greyish-white with a brownish-grey median zone; length 8,0 mm.

Description (regional examples): Shell pupoid-claviform, penultimate whorl nearly as broad as last one, protoconch usually missing in adult, aperture small; teleoconch whorls ca. 5½; early whorls with axial ribs slightly impressed medially, and by penultimate whorl this indentation (rarely absent) lies at one-third of distance below suture, no subsutural cord (although ribs sometimes slightly tumid

below suture), each whorl anteriorly slightly convex; suture shallow, sometimes weakly crenulate; left side of base of body whorl convex-sided, without a distinct fasciole. Aperture with its greatest width median, labrum flattened, siphonal canal short, wide and barely notched dorsally; labial callus thick, forming a strong parietal pad, outer edge slightly free on columella; paries concave, columella rather straight; labrum not thickened, moderately convex in side-view, with a shallow stromboid notch and a wide, moderately deep, asymmetrical anal sinus.

Sculpture of narrow, flexuous axial ribs, spiral sculpture restricted to faint striae and about 6 spiral lirae on rostrum; axials override a swollen varix situated about a quarter-whorl behind labrum; growth-lines strong. Axial ribs suture-to-suture, extending well onto base of body whorl, slightly arcuate and orthocline, narrower than their intervals or (occasionally) equal to them, crests of ribs angular, sides rather steeply sloping, becoming irregular behind lip; 14–17 ribs on 1st teleoconch whorl, 15–22 on penultimate one.

Colour pinkish-white, with a broad light grey to brownish-pink median zone on body whorl, occupying basal third of each spire whorl, with a tinge of this colour on rostrum; aperture stained with brown.

Protoconch (Fig. 15) cyrtoconic, of about 4 whorls, 1st minute, suture shallow, whorls smooth; breadth 0,63 mm, height 0,53 mm.

Dimensions: 7,9 × 2,8 mm, 4,7 × 2,0 mm.

Radula (Fig. 10): Rachidian narrow, with a single keeled, hooked median cusp; lateral plate short and strongly arcuate, with about 8 cusps, which are lacking on outer end; marginal plate relatively short, with the cutting edge extending nearly two-thirds of the length of the plate, and ending in a heel; about 45 rows of teeth.

Range: Polynesia to eastern Transkei.

Regional locality data (all NM): NORTHERN MOZAMBIQUE: Conducia Bay, littoral (J4097, H5986: K. J. Grosch). SOUTHERN MOZAMBIQUE: Two Mile Reef, Benguera Island, Bazaruto Archipelago (J5794: Mrs E. Roscoe). ZULULAND: off Kosi Bay, coral reef, 9–17 m (D9889: D. Herbert). NATAL: Durban Bay dredgings (A4439: B. J. Young); Vetch's Pier, Durban, under rock at LST (D1971: R. K.); Reunion Rocks, N. of Isipingo, on underside of rock in large midtidal gulley (5502, D1970: R. K.). TRANSKEI: Mzamba, beach-drift (5956: R. K.; A9609: J. P. Marais).

Type material: ANSP 15690 (Fig. 80) is labelled as the holotype of *Drillia exilis* but has a badly broken lip and large naticid borehole, and presumably cannot be the figured specimen. It is thus assumed to be a syntype, and is here designated as lectotype; dimensions 5,4 × 1,9 mm. A syntype of *Drillia pusilla* (Fig. 81), ANSP 15689 from Viti Is [= Fiji], is here designated lectotype of that, measurements 6,5 × 2,7 mm.

Notes: The lectotype of *Drillia exilis* is a narrow, orthoconic shell with straight, close axial ribs, while that of *D. pusilla* is pupoid with slightly arcuate, more widely spaced ribs, which are distinctly indented below the suture. Dautzenberg (1929) regarded these two taxa as good species, but Mrs V. Maes (*in litt.* 22/ii/86) assured me that the two extremes intergrade. No examples of the typical form are known from southern Africa or Mozambique.

Several specimens from Two Mile Reef, Benguera Island, Mozambique (NM G4664: Mrs E. Roscoe) and off Durban Bluff, 20–22 m (NM B5492: R. K.) represent a form (Figs. 85–86) that requires further investigation. This is more squat in shape than available examples of *I. exilis* (b/l, excluding protoconch, 0,45), with ribs that are much more strongly convex anteriorly (their additional pale colour conveys to them an almost tuberculate appearance) and fewer in number (13–17 on body whorl); overall size is smaller (5,1 × 2,3 mm) and the anal sinus is shallower. Whether these individuals represent merely an extreme variant of *exilis* remains to be shown.

The closely related *Iredalea pygmaea* (Dunker, 1860) occurs in the tropical Indian Ocean but has not yet been recorded from Mozambique. It has a more ovate shell than *exilis*, with a lower spire, and no trace of a spiral impression below the suture.

*Iredalea inclinata* (Sowerby, 1893) **comb. n.**

Figs 87–90

*Pleurotoma inclinata* Sowerby, 1893: 488, pl. 38, figs 25–26. Type locality: Mauritius.
*Drillia inclinata*; Smith, 1903: 363.

Diagnosis: Shell narrow (b/l 0,35–0,39, a/l 0,31–0,35), whorls not shouldered, subsutural region fairly strongly impressed, basal half-whorl evenly convex; siphonal canal shallowly and widely indented dorsally; fasciole relatively strong; parietal nodule large; anal sinus moderately deep; 12–15 somewhat straight to weakly reversed-sigmoid axial ribs, more or less aligned up spire, with sharp crests and steep sides, extending to rostrum; 4–6 declivous spiral lirae on rostrum; overall surface somewhat silky, with microscopic growth-lines and very fine, dense spiral striae; protoconch conical, of 2½ smooth whorls, breadth 0,70–0,73 mm, b/h 1,03–1,12; marked with orange brown, mainly between ribs, with darker zones above and below periphery, ribs white in peripheral region. Adult length 17–24 mm.

Description: Shell narrowly claviform (b/l 0,35–0,39, a/l 0,31–0,35), with short base and high, acute spire, teleoconch whorls about 9, suture shallow; each whorl strongly convex anteriorly, with periphery at about basal third, fairly strongly concave below suture, without subsutural cord or sulcus; left side of base of body whorl slightly concave, with moderately strong fasciole and slight false umbilicus. Aperture oblong-ovate, with relatively straight columella and concave parietal region, siphonal canal short and wide, its termination very shallowly and slightly obliquely notched; callus moderately thick, its outer edge slightly raised, parietal pad large, filling posterior angle of aperture, constricting anal sinus; labrum almost straight in side-view, with a distinct stromboid notch, anal sinus moderately shallow, openly and asymmetrically U-shaped, directed slightly adapically.

Sculptured by narrow, suture-to-suture axial ribs, that are more or less aligned up spire, rostrum with 4–8 declivous spiral lirae; body whorl with a large varix just behind lip; entire surface with very fine growth-lines and even finer spiral microstriae. Axial ribs slightly opisthocline, relatively straight to reversed-sigmoid, weaker on subsutural constriction, on body whorl usually extending to rostrum,

although occasionally obsolete below parietal/columella junction; crests of ribs sharp with relatively steep sides, subequal to their intervals; 8–12 ribs on early whorls, 12–15 on later ones.

Yellowish-white, patterned with deep brown, mainly between ribs, forming zones above and below periphery, with traces of a third zone at level of columella/parietal junction, crests of ribs in peripheral region white, back of lip with two brown spiral bands, just visible inside aperture; columella and protoconch white.

Protoconch conical, of 2½ whorls, the 1st somewhat depressed, suture shallow, smooth, except for an arcuate terminal rib; breadth 0,70–0,73 mm, height 0,65–0,68 mm (b/h 1,03–1,12).

Dimensions: 24,3 × 9,1 mm, 17,6 × 6,3 mm.

Operculum, radula and soft parts unknown.

Range: Mauritius and Reunion Island to Natal.

Regional locality data: NORTHERN MOZAMBIQUE: Conducia Bay (NM H2471: K. Grosch). ZULULAND: off Kosi Bay, coral reef, 1–4 km S. of estuary, 9–17 m depth (NM D9263: D. Herbert); Nine Mile Reef, Sodwana Bay, 10–18 m (NM D3182: D. Herbert), do, 6–15 m (NM D4541: D. Herbert); Sponge Reef, off Two Mile Reef, Sodwana Bay, 20–22 m (NM D4540: D. Herbert). NATAL: Durban littoral (NM 5931: R. K.); Isipingo littoral (NM 611: H. Burnup, recorded Smith 1903).

Type material: Figured syntype (holotype?) BM(NM) 1879.12.24.3, dimensions 20,0 × 7,8 mm.

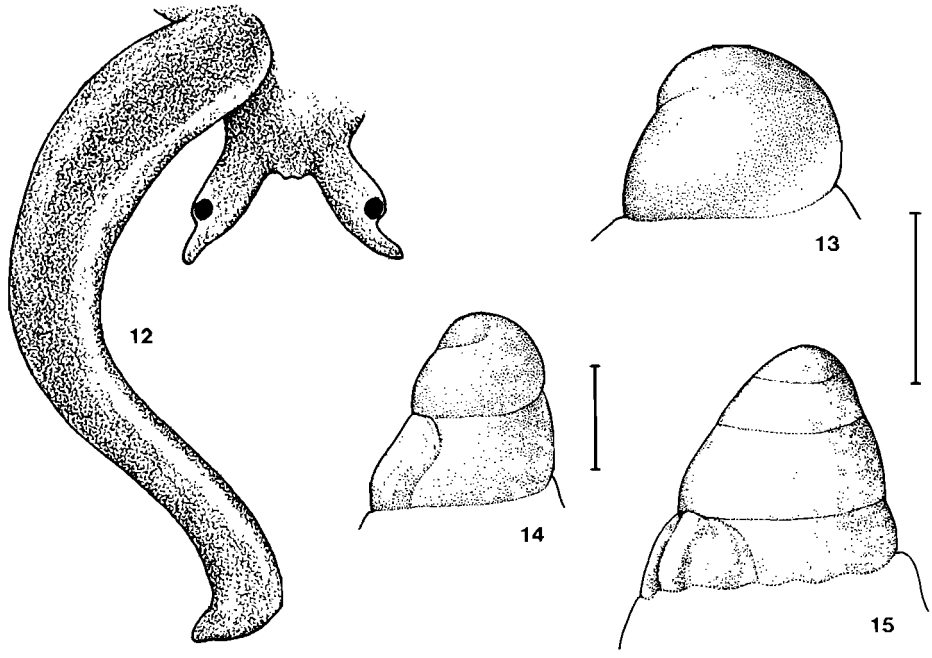
Notes: *Iredalea inclinata* is a rare species, and no live-taken examples are available. An earlier name may conceivably prove to be *Pleurotoma polygonalis* Weinkauff (1876: 100, pl. 21, figs 7,9), based on an immature shell from Zanzibar. *P. polygonalis* was reported from Quirimba Island in northern Mozambique by von Martens (1879: 728). The type figures lack sufficient detail for recognition of this taxon, and the holotype should be re-examined by someone with access to the Dunker collection (ZMB).

Local specimens agree well with the Mauritian type specimen and with a shell from Reunion Island (NM K1102: J. Drivas). My description of the protoconch is based partly on a Reunion juvenile kindly loaned by Mr Drivas.

## *Tylotiella* Habe, 1958

*Tylotiella* Habe, 1958: 52. Type species (o.d.) *Drillia subobliquata* Smith, 1879.

Diagnosis: Shell moderately small (9–24 mm), narrowly claviform, base truncate, siphonal canal short, wide, shallowly notched; sculptured by arcuate or reversed-sigmoid, suture-to-suture axial ribs (weaker below suture), usually with a strong varicoid rib behind lip; spiral sculpture usually of a few ridges on rostrum and fine microstriae elsewhere; anal sinus openly U-shaped, but somewhat constricted by the large parietal nodule, stromboid notch deep to weak; colour usually brown with dark and pale zones. Protoconch domed to bluntly conical, of 1½–2½ whorls, smooth, except sometimes for axial riblets on last whorl. Operculum oblanceolate,




Figs 12–15. **12**, Head and penis of *Drillia (Clathrodrillia) connelli* sp. n. **13–14**, Protoconchs of some Drilliinae: **13**, *Acinodrillia viscum* sp. n.; **14**, *Agladrillia ukuminxa* sp. n.; **15**, *Iredalea exilis* (Pease, 1868).

with terminal nucleus. Radula drilliine, rachidian quadrate, with mesocone flanked by fine denticles, lateral plate with denticles strongest towards inner end, marginal with flattened cutting blades.

Notes: *Tylotiella* is one of a complex of rather poorly differentiated genera and subgenera. It is sometimes treated as a subgenus of *Clavus* Montfort, 1810, from which it differs in its axial ribs reaching the suture (although sometimes feebly so), in its somewhat narrower proportions, and in lacking the peripheral spines or angles that characterise most species of *Clavus*. *Cerodrillia* Bartsch & Rehder, 1939, of the Western Hemisphere, appears to be distinguished by its trigonal rachidian plate (Powell 1966: Fig. D90, McLean 1971: Fig. 24), and generally by its angulate whorls and more sloping base. Another American genus, *Syntomodrillia* Woodring, 1928, was applied by Powell (1942) to a number of Australian fossil species, some apparently similar to *Tylotiella*, but the type species, as figured by Kaicher (1984: No 3966), has the base of its outer lip strongly drawn in below, rather as in *Agladrillia*.

Shuto (1975: 165, pl. 4, fig. 3) published notes on the holotype of *Tylotiella subobliquata*, the type species of the genus; its radula was figured by Habe (1958: pl. 3, fig. 7). Although applied to only a few tropical species by Powell (1966: 72), *Tylotiella* appears to be a wide-spread genus, with some temperate-water representatives, at least in southern Africa. Of the local species included here, *T. quadrata* sp. n. is a doubtful member of the genus, and *T. sulekile* sp. n. and *Drillia falcicosta* Barnard, 1958, are also potentially discordant elements.

Key to species of *Tylotiella* in southern Africa and Mozambique

1 Sculptured overall by raised spiral threads ..... 2
— Spiral threads microscopic or absent, except on rostrum ..... 4
2 Body whorl rather quadrate, spire rather low, b/l 0,45, protoconch large (breadth ca. 1,13 mm) ..... **quadrata**
— Body whorl not quadrate, spire high, b/l 0,34–0,42, protoconch smaller (breadth 0,78–0,90 mm) ..... 3
3 Spiral threads fine and numerous; strongly patterned ..... **herberti**
— Spiral threads relatively coarse and widely spaced, about 5 on penultimate whorl; colour uniform ..... **sulekile**
4 Whorls distinctly shouldered, axial ribs undulating where they cross base of body whorl ..... **papilio**
— Whorls not shouldered, axial ribs not undulating on base ..... 5
5 Terminal varix weak, subsutural region dark ..... **hottentota**
— Terminal varix strong, subsutural region not contrastingly dark ..... 6
6 Base of body whorl with a row of weak white pustules ..... **basipunctata**
— Base of body whorl without such pustules ..... 7
7 Axial ribs weakening below suture ..... 8
— Axial ribs not weakening below suture ..... **falcicosta**
8 Shell slender (b/l 0,29–0,37), with moderately convex whorls, without a pale peripheral zone ..... **burnupi**
— Shell relatively broad (b/l 0,37–0,41) with strongly convex whorls and a pale peripheral band ..... **isibopho**

*Tylotiella burnupi* (Sowerby, 1897) **comb. n.**

Figs 90–93

*Pleurotoma burnupi* Sowerby, 1897: 3, pl. 8, figs 1, 2. Type locality: Durban.
*Drillia (Cerodrillia) burnupi*; Kilburn, 1970: 39, fig. 1 (radula).
*Drillia hottentota* (partim, *non* Smith, 1882); Barnard, 1958: 120.
*Non: Drillia burnupi*; Turton, 1932: 22 [= *Anachis* sp. (Columbellidae)].

Diagnosis: Shell narrow (b/l 0,29–0,37, a/l 0,32–0,35), whorls not shouldered, subsutural region shallowly impressed, basal $\frac{2}{3}$ whorl evenly convex; siphonal canal not dorsally notched; fasciole relatively weak; anal sinus moderately shallow, directed slightly adapically; 10–14 weakly reversed-sigmoid axial ribs with angularly rounded crests and sloping sides, evanescing at parietal level; 4–7 declivous spiral lirae on rostrum; overall surface glossy, with microscopic growth-lines and faint spiral striae; protoconch of $1\frac{1}{2}$ whorls with fine axial plicules on last quarter-whorl, breadth 0,75–0,78 mm, b/h 1,19–1,29; light to dark orange brown, either uniform (except for white axials and intervening dark orange-brown spots) or with rostrum and subsutural region pale brown to white. Adult length 11,2–14,2 mm.

Description: Shell narrowly claviform (b/l 0,29–0,37, a/l 0,32–0,35), with an acute, slightly cyrtoconic spire and moderately short, truncate base; suture shallow, teleoconch whorls about 7, subsutural region only shallowly concave (without distinct cord or sulcus), basal $\frac{1}{2}$–$\frac{2}{3}$ of whorl gently and evenly convex, periphery at basal third, no trace of shoulder; left side of base of body whorl concave, fasciole

slight, false umbilicus feeble and rimate. Aperture oblong-ovate, greatest width more or less median, labrum somewhat straight medially; siphonal canal moderately wide, short, termination not indented; labial callus thick, forming moderately strong pad in posterior angle of aperture, constricting anal sinus, outer edge of callus not free on columella; labrum thin, gently curved in side-view, with distinct stromboid notch and moderately shallow, openly U-shaped anal sinus, directed slightly adapically.

Glossy, sculptured by low, suture-to-suture axial ribs, one behind lip being varicoid, and 4–7 declivous spiral lirae on rostrum; microsculpture of fine growth-lines and traces of very faint spiral striae. Axial ribs weak below suture, on body whorl extending anteriorly to parietal level, opisthocline, weakly reversed-sigmoid, recurved below suture, narrower than intervals, crests angularly rounded, with sloping sides, 10–14 per whorl.

Colour deep brown to dark yellowish-brown (fading to strong yellowish-brown), usually paler on rostrum and below suture, crests of ribs white, at least above periphery, occasionally with dark blotches on subsutural concavity; back of lip yellowish-white with two spiral brown bands; protoconch pale.

Protoconch domed, of about $1\frac{1}{2}$ whorls, the 1st somewhat depressed; smooth except for last quarter whorl, where there are fine, dense axial plicules; breadth 0,75–0,78 mm, height 0,58–0,63 mm (b/h 1,19–1,29).

Dimensions: $14{,}2 \times 5{,}2$ mm, $11{,}2 \times 3{,}9$ mm.

Radula: see Kilburn (1970).

Range: Southern Mozambique to eastern Transkei, littoral.

Locality data (all NM): SOUTHERN MOZAMBIQUE: Bazaruto Island (4384: Mrs K. Eastwood); Santa Carolina Island, 15 ft (J5793: Mrs E. Roscoe). NATAL: Umhlali beach (604: H. C. Burnup); Durban (B5743, 6686, 605–608: Burnup; 5932: R. K.); Port Shepstone (6685: Burnup). TRANSKEI: Mzamba (B4669: R. K.); Port Grosvenor (B912: R. K.); Mbotyi (C8359: R. K., D. G. Herbert); Mkambati (C5650: R. K.); Msikaba (C5515: R. K.).

Notes: An uncommon species, on occasion found living on the undersides of rocks in low-tide pools.

Two *ex pisce* specimens (Fig. 94) collected off southern Mozambique, between Zavora and Maputo (NM J487: C. Fernandes) differ from *T. burnupi* in being pale yellowish-brown with a broad subsutural band of orange-brown delimited anteriorly by a pale line, and they have a slightly higher spire and slightly more convex spire whorls. In colour pattern they resemble *Mangilia decaryi* Dautzenberg (1932: 19, pl. 1, fig. 2) from Madagascar, and may prove referable to that taxon. A bleached syntype (Figs 95–96) of *decaryi* (IRSN 8291, Dautzenberg collection) differs slightly in shape from *burnupi*, and has a slightly smaller protoconch (breadth 0,73 mm).

### **Tylotiella basipunctata** sp. n.

Figs 7, 97–100

Diagnosis: Shell as in *T. burnupi*, but with a row of white dots (usually raised) on ribs at level of paries; axial ribs continue to rostrum (or nearly so) and are arcuate

on spire whorls; each whorl sometimes slightly overhanging that below; anal sinus somewhat narrower; protoconch smaller (breadth 0,65–0,68 mm), lower (b/h 1,36–1,63) and often brown; adult length 7,4–12,5 mm.

Description: Shell narrowly claviform (b/l 0,33–0,39, a/l 0,31–0,39), with an acute, slightly cyrtoconic spire and moderately short, truncate base; suture shallow, teleoconch whorls about 7, subsutural region only shallowly concave (without distinct cord or sulcus), basal $\frac{1}{2}$–$\frac{2}{3}$ of whorl gently and evenly convex, somewhat overhanging subsequent whorl, periphery at basal third, no trace of shoulder; left side of base of body whorl concave, fasciole slight, false umbilicus feeble and rimate. Aperture oblong-ovate, greatest width more or less median, labrum somewhat straight medially; siphonal canal moderately wide, short, termination not indented; labial callus thick, forming weak to moderately strong pad in posterior angle of aperture, constricting anal sinus, outer edge of callus not free on columella; labrum thin, gently curved in side-view, with distinct stromboid notch and moderately shallow, openly U-shaped anal sinus, directed slightly adapically.

Glossy, sculptured by low, suture-to-suture axial ribs, one behind lip being varicoid, and 5–8 declivous spiral lirae on rostrum; microsculpture of fine growth-lines and faint spiral striae. Axial ribs weak below suture, on body whorl extending anteriorly almost to rostrum, opisthocline, on spire whorls somewhat arcuate, narrower than intervals, crests somewhat rounded, with sloping sides, 10–12 ribs per whorl.

Patterned with a median zone of strong to moderate yellowish-brown, rostrum, ribs and often subsutural region yellowish-white, usually with an occasional moderate yellowish-brown blotch between ribs; base of body whorl with a row of white dots, which are situated on ribs and are usually raised, and on back of lip divide median brown zone into two; protoconch often yellowish-brown.

Protoconch domed, of about $1\frac{3}{4}$ whorls, 1st one somewhat depressed, smooth except for a few terminal axial riblets; breadth 0,65–0,68 mm, height 0,40–0,50 mm (b/h 1,36–1,63).

Dimensions: 9,1 × 3,3 mm (holotype); largest adult paratype 12,5 mm (lip broken), smallest 7,4 × 2,9 mm.

Operculum oblanceolate, nucleus terminal, apex blunt, growth-lines coarse; brownish-orange.

Radula (Fig. 7) as in *T. burnupi*, but rachidian plate broader; about 36 rows of teeth.

Range: Littoral of northern Mozambique.

Type material: Holotype NM J7177/T3585, Nacala (14°31′S, 40°59′E), don. Mrs H. Boswell. Paratypes 1–9, NM K1535/T3586, same data. Paratypes 10–15, NM H5584/T3735, Conducia Bay, under rocks in soft sand, above *Thalassodendron*, some current; K. J. Grosch. Paratypes 16–21, NM H5583/T3587, and 22–30, NM J4095/T3588, Conducia Bay, K. Grosch. Paratypes 31–34, NM J3308/T3589, Chocas, Conducia Bay, K. Grosch. Paratype 35, NM K357/T3590, Quirimba Island, worn, R. K.

Notes: *T. basipunctata* appears to replace the subtropical *T. burnupi* on the coral coast of northern Mozambique and will probably prove to have an East African distribution.

**Tylotiella isibopho** sp. n.

Figs 101–104

Diagnosis: Shell moderately broad (b/l 0,37–0,41, a/l 0,35–0,41), whorls with slight, rounded shoulder, subsutural region shallowly impressed, basal $\frac{2}{3}$ of each whorl evenly and fairly strongly convex; siphonal canal not dorsally notched; fasciole moderately strong; anal sinus relatively deep, directed slightly adapically; axial ribs 14–15, weakly reversed-sigmoid, with angularly rounded crests and moderately steep sides, usually extending to rostrum; 6–7 declivous spiral lirae on rostrum; overall surface glossy, with microscopic growth-lines and very faint spiral striae; protoconch of $1\frac{3}{4}$ whorls with growth-lines on last quarter-whorl, breadth 1,00–1,13 mm, b/h 1,13–1,39; base dark orange-brown, paler below suture, periphery with broad band of brownish-buff, bordered above by a brown line, and below by a white one, these lines sometimes broken. Adult length 16,4 mm.

Description: Shell claviform (b/l 0,37–0,41, a/l 0,35–0,41) with slightly cyrtoconic spire and fairly large aperture, base truncate, bent slightly to right, apex not papilliform; suture shallow, undulating; teleoconch whorls about 6; whorls strongly convex, feebly and roundedly shouldered, with periphery at about posterior third, subsutural region gently concave, without cord or sulcus; left side of base of body whorl slightly concave, fasciole moderately strong, without false umbilicus. Aperture oblong-ovate, greatest width slightly anterior to median, siphonal canal wide and short, termination moderately indented, labial callus thick, its outer edge free on columella, parietal pad small, narrow, on outer margin of callus, continuous with labrum, not constricting anal sinus; labrum thin, slightly incurved, in side-view gently convex, with a well-developed stromboid notch and open, asymmetrically U-shaped anal sinus, directed somewhat adapically, its anterior border feebly alate.

Glossy, with relatively strong axial ribs and 6–7 declivous spiral lirae on rostrum; microscopic growth-lines and exceedingly fine and inconspicuous spiral striae present, lip preceded by a varicoid rib. Axial ribs suture-to-suture, although becoming relatively weak above periphery, reaching rostrum, but somewhat irregular near terminal varix, subequal to their intervals, crests angularly rounded, sides fairly steeply sloping, opisthocline, weakly reversed-sigmoid; about 8 ribs on 1st whorl, initially feeble, penultimate whorl with 14–15 ribs.

Base of body whorl moderate or deep brown, this colour showing above suture from third whorl onwards and occupying basal third of penultimate whorl; periphery with a broad band of pale orange-yellow, delimited below by a white line and above by a brown one (sometimes followed by another white line), these bordering lines sometimes restricted to the ribs; subsutural region strong to deep brown, sometimes suffusing median pale band on body whorl, back of body whorl uniform deep brown with an interrupted row of white dots; apical whorls light yellowish-brown; labium and aperture brownish-orange.

Protoconch narrowly domed, of about $1\frac{3}{4}$ whorls, 1st whorl depressed, smooth except for growth lines near termination, abruptly demarcated (although teleoconch is initially smooth except for coarse growth-lines); breadth 1,00–1,13 mm, height 0,75–0,93 mm (b/h 1,13–1,39).

Dimensions: 16,4 × 6,1 mm (holotype); smallest adult paratype 14,5 × 5,6 mm.

Operculum, radula and soft parts unknown.

Range: Continental shelf of eastern Cape to eastern Transkei, on sponge bottoms in 85–100 m.

Type material (all NM: *MN*): Holotype C5296/T3577, off Mzamba River, Transkei (31°06,0'S, 30°18,3'E), 100 m, sponge-rubble. Paratype 1, C576/T3682, off Port Grosvenor, Transkei, 95–100 m, coarse sand, few gorgonians, a juvenile. Paratypes 2–5, C9485/T3710, off Whale Rock, Transkei, 90 m, sponge-rubble, coarse sand, some rocks. Paratype 6, C1951/T3580, off Mbashe River, Transkei, 100 m, sponges, marine growths, little sand. Paratype 7, C9628/T3578, off Qora River, Transkei, 100 m, coarse sand, some sponge-rubble. Paratype 8, C4596/T3581, off Sandy Point, Transkei, 97 m, gorgonians, stylasterids, sponges. Paratype 9, B8380/T3579, off Nahoon, eastern Cape Province, 85 m, medium sand, broken shell. Paratype 10, B7995/T3582, off East London, 90 m, coarse sand, sponges.

Notes: *Tylotiella isibopho* superficially resembles *T. herberti* in form and colour, but is much larger, with axial ribs that extend from suture to base, spiral sculpture that is restricted to the rostrum (other than microstriae) and a siphonal canal that is wider and less obliquely truncate.

This species is one of the most vividly patterned of South African clavines. In contrast to the adult whorls, the initial teleoconch whorl is not only feebly sculptured, but also lacks colour pattern.

Etymology: *isibopho* = a band of colour (Xhosa).

**Tylotiella papilio** sp. n.

Figs 114–115

Diagnosis: Shell moderately broad (b/l 0,38–0,41, a/l 0,29–0,41), whorls with distinctly angular shoulder, subsutural region moderately impressed, basal $\frac{2}{3}$ of each whorl evenly convex; siphonal canal not dorsally notched; fasciole slight; anal sinus relatively deep, opening strongly constricted, directed slightly adapically; axial ribs 13–19 per whorl, almost straight but strongly recurved below suture, with angular crests and steep sides, on base extending in an undulating fashion to rostrum; 3–8 declivous spiral lirae on rostrum; overall surface with microscopic growth-lines and sometimes very faint spiral striae; protoconch of about 2 smooth whorls, breadth 0,78–0,80 mm, b/h 0,94–1,03; light brown with pale orange-brown median zone, bordered both above and below by two interrupted lines, one orange-brown, one white, with a third line of brown dashes on base of last whorl, crests of ribs white. Adult length 12,7 mm.

Description: Shell claviform (b/l 0,38–0,41, a/l 0,29–0,41, with an acute, slightly cyrtoconic spire, somewhat obconic body whorl, and moderately short, truncate, slightly oblique base; suture shallow; teleoconch whorls about $6\frac{1}{2}$; whorls moderately strongly convex, except below suture, where they are fairly strongly but evenly concave, periphery initially median, on later whorls forming a distinct shoulder slightly above midwhorl, no subsutural cord; left side of base of body whorl shallowly concave, fasciole slight, no false umbilicus. Aperture oblong, greatest width at about posterior third, labrum slightly flattened medially,

columella slightly convex; siphonal canal wide, short, termination not indented; labial callus moderately thin, forming a strong, projecting pad in posterior angle of aperture, constricting anal sinus, outer edge of callus not free on columella; labrum thin, gently curved in side-view, with deep stromboid notch (anterior to which the lip forms a feeble denticle) and rather deep, rounded, U-shaped anal sinus, with strongly constricted opening.

Sculptured by somewhat elevated, suture-to-suture axial ribs, one behind lip being varicoid, and 3–8 declivous spiral lirae on rostrum; with fine growth-lines and sometimes very fine spiral microstriae. Axial ribs markedly weaker below suture, on body whorl extending anteriorly onto rostrum, continuing in vermiculate fashion to intersect basal lirae, strongly opisthocline, almost straight except above shoulder, where strongly recurved, much narrower than intervals, crests angular, with steeply sloping sides; 8–9 ribs on 1st whorl, 13–19 on penultimate whorl.

Colour pattern complex: [very] light yellowish-brown, with a line of moderate orange dashes (interrupted by ribs) at shoulder and another shortly above suture, body whorl with a third row of dashes at parietal level, the zone between 2nd and 3rd rows darker yellowish-brown than elsewhere; subsutural and shoulder region with diffuse, inconspicuous blotches of moderate orange; base of body whorl paler than elsewhere, crests of ribs whitish; aperture with transverse bars of moderate orange.

Protoconch narrowly domed, of about 2 smooth whorls, 1st one depressed but rounded; breadth 0,78–0,80 mm, height 0,78–0,83 mm (b/h 0,94–1,03).

Dimensions: 12,4 × 4,8 mm (holotype); 12,8 × 4,4 mm (largest paratype).

Operculum, radula and soft parts unknown.

Range: Continental shelf of Zululand, 70–110 m.

Type material (all NM): Holotype A5617/T3711, off Sodwana Bay, from gut of slinger fish (*Chrysoblephus puniceus* Gilchrist & Thompson, 1908), J. P. Marais. Paratype 1, D1521/T3712, off Durnford Point, 110 m, A. Connell. Paratypes 2–3, D8469/T3937, off Jesser Point, 70 m, medium sand, *MN*. Paratypes 4–6, D6635/T3938, off Gobey's Point, 55–100 m, sand, shell-rubble, *MN*. Paratype 7, D9028/T3939, off Kosi Bay, 75 m, coral-rubble, sandstone, marine growths, *MN*.

Notes: *T. papilio* somewhat resembles the much larger *T. pulchella* (Reeve, 1845), but lacks distinct spiral microstriae, has more numerous axial ribs and differs in details of colour pattern. In colour pattern it is not dissimilar to *T. isibopho*, but differs in its angular shoulder, more obconic body whorl and the peculiarly vermiculate basal extensions of the ribs.

Etymology: *papilio* = a butterfly (L.).

### **Tylotiella herberti** sp. n.

Figs 105–108

Diagnosis: Shell moderately narrow (b/l 0,34–0,42, a/l 0,34–0,42), whorls not shouldered, subsutural region shallowly impressed, basal $\frac{2}{3}$ of each whorl evenly and moderately strongly convex; siphonal canal not dorsally notched; fasciole relatively weak; anal sinus moderately deep, directed slightly adapically; axial ribs

9–12 per whorl, weakly reversed-sigmoid, with rounded crests and sloping sides, feeble below suture and evanescing at parietal level; somewhat glossy, with microscopic growth-lines and fine spiral threads overall, the latter strongest on rostrum; protoconch of $1\frac{3}{4}$ whorls with growth-lines on last quarter-whorl, breadth 0,78–0,88 mm, b/h 0,94–1,21; orange-brown, flecked with off-white, sometimes overall, but usually on posterior part of whorl, with two lines of conspicuous pale flecks at periphery; at eastern extreme of range sometimes with a pale peripheral line or band. Adult length 6,4–16,4 mm.

Description: Shell claviform (b/l 0,34–0,42, a/l also 0,34–0,42), spire slightly cyrtoconic, base moderately long, tapering and obliquely truncate; teleoconch whorls about 5, suture shallow, not undulating, each whorl with periphery median, not shouldered, subsutural region slightly concave, without cord or sulcus, left side of base of body whorl concave, fasciole weak, false umbilicus slight or absent. Aperture oblong-ovate, siphonal canal wide and short, its termination not notched dorsally; labial callus moderately thick, its outer edge slightly raised on columella and posteriorly forming a narrowly elongated parietal pad, which is continuous with labrum, but does not constrict anal sinus; labrum thin, slightly incurved, in side-view moderately convex, stromboid notch shallow, anal sinus fairly deep, openly U-shaped, directed outward, its lower border not alate.

Sculptured by weak axial ribs and very fine, somewhat feeble spiral threads overall; lip preceded by a fairly weak varix, growth-lines fine and regular. Axial ribs strongly opisthocline, suture-to-suture, but weak to almost obsolete above shoulder on later whorls, and on body whorl evanescing at parietal level and behind lip, equal to or slightly narrower than their intervals, crests rounded, sides sloping, weakly reversed-sigmoid; 9–12 ribs per whorl.

Colour typically moderate to brownish-orange, uniform on base except for a few rows of faint pale flecks; posteriorly each whorl is usually heavily flecked with yellowish-white, usually with 2–3 lines of spots in peripheral area; in eastern part of range, whorls are often light yellowish-brown posteriorly, with a yellowish-white line or broad band in peripheral area.

Protoconch blunt, narrowly domed, $1\frac{3}{4}$ whorls, 1st one depressed; smooth except for terminal growth-lines; breadth 0,78–0,88 mm, height 0,73–0,90 mm (b/h 0,94–1,21).

Dimensions: 16,4 × 6,1 mm (holotype); 6,4 (protoconch broken) × 2,8 mm (smallest adult paratype).

Operculum, radula and soft parts unknown.

Range: East London to southern Natal, littoral.

Type material: Holotype NM C7411/T3591, off Whale Rock, Transkei (31°56,9′S, 29°13,5′E), 20–26 m, sand and gorgonians, dredged *MN*. Paratypes 1–4, NM D2231/T3598, East London, R. K. Paratypes 5–13, NM C9623/T3597, Dwesa, Transkei, R. K. Paratypes 14–18, NM 5965/T3596, Xora, Transkei, R. K. Paratype 19, NM A2793/T3817, Xora, Mrs C. M. Connolly. Paratype 20, NM 6961/T3599, Nthlonyane, Transkei, R. K. Paratype 21, NM B6170/T3595, Coffee Bay, Y. McLellan. Paratype 22, NM C9627/T3594, same data as holotype. Paratypes 23–34, NM C188/T3816, between Lwandile and Mdumbi, Transkei, R. K.,

R. Fregona. Paratype 35, NM A6501/T3592, Mgazi, Transkei, Mrs C. M. Connolly. Paratypes 36–47, NM C8180/T3818, Mbotyi, Transkei, R. K., D. Herbert. Paratype 48, NM A1562/T3604, Mzamba, Transkei, R. K. Paratypes 49–55, NM B4672/T3603, Mzamba, R. K. Paratype 56, NM 5959/T3601, Shelley Beach, S. of Port Shepstone, R. K. Paratypes 57–64, NM 2896/T3600, 6684/T3602, Port Shepstone, worn, H. C. Burnup.

Notes: *Tylotiella herberti* was originally thought to be a Transkeian colour form of *Naudedrillia praetermissa*. However, the protoconch is consistently smaller, as is adult size, spiral sculpture is finer, whorls are not shouldered, the aperture is less elongate, and the lip is not alate as in fresh examples of *praetermissa*. The dark brown base, contrasting with the paler subsutural region (from Mbotyi southward/eastward (Fig. 108) often with a pale peripheral band), further distinguishes this species from *praetermissa*, but resembles the pattern found in *T. isibopho*. The last is a much larger species, with suture-to-base axial ribs; spiral lirae are restricted to the rostrum, and the siphonal canal is less obliquely truncate. One of the beach-worn syntypes of *Drillia zenobia* Turton, 1932, may possibly be *T. herberti*, but the majority are referable to *N. praetermissa* (q.v.); *herberti* is not known to occur as far west as Port Alfred. Similarly, the figured type of *Drillia neptuni* Turton, 1932, although immature, worn and lacking its protoconch, measures 14,0 × 4,5 mm, and presumably cannot be referable to *T. herberti*.

Etymology: Named in honour of my colleague Dr D. G. Herbert.

*Tylotiella hottentota* (E. A. Smith, 1882) **comb. n.**

Figs 109–113

*Pleurotoma (Clavus) hottentota*; E. A. Smith, 1882: 208; Sowerby, 1892: 5. pl. 4, fig. 81. Type locality: Port Elizabeth.
*Drillia hottentota*; Bartsch, 1915: 21; Turton, 1932: 21, pl. 4, no 161; [partim] Barnard, 1958: 120.
*Austrodrillia hottentota*; Kilburn & Rippey, 1982: 117, 214, text fig. (holotype), pl. 28, fig. 6.
*Drillia hottentota* var. *fuscescens* Sowerby, 1921: 127; Turton, 1932: 21, pl. 4, no. 162. Type locality: Port Alfred.

Diagnosis: Shell moderately narrow (b/l 0,34–0,40, a/l 0,31–0,40), whorls not shouldered, subsutural region shallowly impressed, basal $\frac{2}{3}$ of each whorl evenly convex; siphonal canal not dorsally notched; fasciole relatively weak; anal sinus moderately shallow, directed slightly adapically; prelabral varix feeble; axial ribs 14–16, weakly reversed-sigmoid, rounded in cross-section, feeble below suture and usually evanescing at parietal level; 6–7 weak spiral lirae on rostrum; overall surface glossy, with fine growth-lines and microscopic spiral striae; protoconch of $1\frac{3}{4}$ whorls, breadth 0,98–1,00 mm, b/h 1,33–1,56; three forms: brown with pale ribs and faint lines of pale dots, or with darker brown shoulder slope and paler peripheral band, or white with a broken brown band on shoulder slope, early whorls brown. Adult length 8,5–16,3 mm.

Description: Shell narrowly claviform (b/l 0,34–0,40, a/l 0,31–0,40), spire slightly cyrtoconic, base moderate, truncate; teleoconch whorls up to 6, suture shallow; subsutural region shallowly concave, sometimes slightly tumid at suture, periphery at or just above midwhorl, not forming a distinct shoulder; left side of base of body whorl slightly concave, fasciole weak, sometimes with a feeble false umbilicus.

Aperture oblong-ovate, siphonal canal moderately wide and short, termination only slightly indented; labial callus thick, its outer edge slightly free on columella, and forming a thick pad at posterior angle of aperture, this pad fused to labrum and constricting anal sinus; labrum thin, gently curved in side-view, with a slight stromboid notch and a deep U-shaped anal sinus, directed more or less outwards.

Glossy, sculptured by low axial ribs, with no varices; spiral lirae restricted to 6–7 on rostrum, weak and rounded, either close or widely-set; microsculpture of growth-lines and finer spiral striae. Axial ribs opisthocline, weakly reversed-sigmoid, rounded in section, equal to/slightly wider than intervals, initially suture-to-suture, but becoming progressively weaker on shoulder slope, by last whorl feeble below suture (although not terminating abruptly) and behind lip; on body whorl usually evanesce at parietal level, but occasionally continue to rostrum; 9–12 on 1st whorl, 14–16 on penultimate whorl.

Three intergrading colour-forms: *(a)* Strong brown or [near] brownish-orange, uniform except for faint lines of pale dots, and paler ribs and rostrum; *(b)* Moderate orange to light yellowish-brown, usually with 2–3 spiral lines of diffuse pale flecks and a paler brown zone around periphery, ribs often pale, subsutural region (above periphery) often contrasting brownish-orange or with oblique marks of that colour; *(c)* Early whorls as in *(b)*, but later ones pure white below periphery.

Protoconch narrowly domed, of about $1\frac{3}{4}$ whorls, 1st one depressed; evidently smooth [all specimens more or less worn] termination sharply defined; breadth 0,98–1,00 mm, height 0,63–0,75 mm (b/h 1,33–1,56).

Dimensions: 16,3 × 5,7 mm; 8,5 × 3,44 mm (largest and smallest adults).

Operculum, radula and soft parts unknown.

Range: Cape Agulhas to western Transkei, littoral.

Locality data (all NM): AGULHAS AREA: Cape Agulhas (A2791: Mrs C. M. Connolly). TSITSIKAMMA COAST: Mossel Bay (B6826: ex Albany Mus.). EASTERN CAPE: Jeffreys Bay (B335: F. Graeve; 6683: W. Falcon; A2841: Mrs C. M. Connolly); Port Alfred (B659, B660: E. K. Jordan; 609, 618: H. C. Burnup; B4379: H. Becker; A1593: R. K.). TRANSKEI: Dwesa, worn (C6085: R. K.).

Type material: Holotype of *P. hottentota* (Fig. 109) in BM(NH), dimensions 12,5 × 4,7 mm.

Notes: Common in beach-drift, but invariably worn. Agulhas examples (Fig. 113) appear to be somewhat narrower than elsewhere, but my sample is inadequate for analysis. In the eastern Cape, individuals may develop a mature aperture at 4–5 teleoconch whorls, and a length of only 8,5–10,9 mm; these examples are somewhat broader (b/l 0,38–0,40 against 0,34–0,38), with a lower spire (a/l 0,34–0,40, against 0,31–0,34) than typical adults, but agree in other characters.

### *Tylotiella falcicosta* (Barnard, 1958) **comb. n.**

Figs 116–117

*Drillia falcicosta* Barnard, 1958: 132, fig. 15b. Type locality: Off Umhloti (Umdloti) River, 40 fathoms.

Diagnosis: Shell broadly claviform (b/l 0,47–0,48, a/l 0,43), apex moderately blunt, base short, slanting slightly to right; suture not undulating; whorls convex, with

feeble shoulder, slightly swollen below suture; fasciole absent; siphonal canal relatively short and rather wide, labrum medially flattened; columella slightly convex; parietal nodule very small, not constricting anal sinus, which is deep, wide and asymmetrical, its lower border weakly alate, stromboid notch slight; axial ribs thin, low, reversed-sigmoid, suture-to-suture, 12–16 on penultimate whorl; faint spiral striae overall, with 9–10 spiral threads on rostrum; body whorl with rib-like varix behind lip; dull, buff to deep orange-brown, with or without a few spiral zones of dark and light spots. Protoconch narrowly domed; breadth 0,85–1,00 mm. Attains 6,1 mm.

Description: Shell small, somewhat broadly claviform (b/l 0,47–0,48, a/l 0,43) with blunt apex, rostrum moderately short, base slanting distinctly to right, somewhat squarely truncate; teleoconch whorls 4, suture rather shallow; whorls only moderately convex, very feebly shouldered, periphery at mid-whorl, very shallowly and evenly concave above periphery, slightly swollen below suture, but without a definite subsutural cord; left side of base of body whorl only slightly concave, no fasciole or false umbilicus. Aperture oblong, greatest width median, labrum flattened medially, columella slightly convex, parietal region concave, siphonal canal short, very broad, shallow, oblique and almost parallel-sided, termination not distinctly indented; labial callus moderate, outer edge slightly free on columella, parietal nodule small, continuous with labrum, not constricting entrance to anal sinus; labrum strongly convex in side-view, with shallow but distinct stromboid notch and deep, widely open, asymmetrically U-shaped anal sinus, which is directed slightly adapically, its lower border slightly and roundedly alate.

Sculptured by thin, low, suture-to-suture axial ribs and faint spiral striae, strengthening on rostrum to form 9–10 spiral lirae; growth-lines mostly fine but distinct; body whorl with a strong prelabral varix. Axial ribs reversed-sigmoid, opisthocline, recurved below suture, reaching lower suture and on body whorl extending to columella/parietal junction, narrower than intervals, crests angular, sides fairly steep; 1st whorl with 11–13 ribs, penultimate whorl with 12–16.

Colour matt, pale orange-yellow to strong brown, body whorl sometimes with several widely spaced zones of small, inconspicuous darker and lighter squares.

Protoconch narrowly domed, of about 2 whorls, initially small and depressed, 2nd whorl moderately convex, smooth except for growth-lines near termination, lip strongly arcuate, opisthocline; breadth 0,85–1,00 mm, height 0,65–0,95 mm (b/h 1,05–1,31).

Dimensions: 5,7 × 2,7 mm (holotype); 6,1 × 2,9 mm.

Operculum resembling that of *Clavus unizonalis* (Fig. 5), but with terminal nucleus; relatively thick, brown.

Range: Continental shelf of Natal and Zululand in 70–120 m.

Locality data: ZULULAND: off Durnford Point, 120 m (NM D4499: A. Connell). NATAL: off Umlaas Canal, 75 m, muddy sand (NM D1626: *MN*); between Umgababa and Umzimbazi Rivers, 70 m, fine sand (NM D3561: *MN*).

Type material: Syntypes (one adult, one juvenile, one worn apex) SAM A8724; adult shell (5,7 × 2,7 mm) here designated lectotype (Figs 116–117).

Notes: The two eroded shells from off O'Neil Peak, mentioned by Barnard, may or may not be referable to this species. *Syntomodrillia ludbrookae* Powell, 1944, from the Pliocene of South Australia, is very similar to *T. falcicosta* but slightly narrower.

**Tylotiella quadrata** sp. n.

Figs 118–119

Diagnosis: Shell broadly claviform (b/l 0,45, a/l 0,39), body whorl rather oblong-quadrate, apex moderately blunt, base short, slanting slightly to right; suture not undulating; whorls weakly convex, without angle or shoulder, slightly swollen below suture; fasciole feeble; siphonal canal relatively short and rather wide, labrum medially flattened; columella straight; parietal nodule moderately small, laterally compressed, slightly constricting anal sinus, which is deep, rather wide and asymmetrical, its lower border not alate, stromboid notch very slight; axial ribs thin, very low, weakly reversed-sigmoid, suture-to-suture but very weak on shoulder slope, 17 ribs on penultimate whorl; low spiral threads overall, about 18 on penultimate whorl; body whorl with weak, broad varix behind lip; surface dull, uniform light brown. Protoconch narrowly domed; breadth 1,13 mm. Attains 8,9 mm.

Description: Shell small, somewhat broadly claviform (b/l 0,45, a/l 0,39) with subcylindrical body whorl and fairly blunt apex, rostrum moderately short, base slanting somewhat to right, rather squarely truncate; teleoconch whorls 4, suture rather shallow; whorls rather weakly convex, not shouldered, periphery slightly below mid-whorl, very slightly concave above periphery, slightly swollen below suture, but without a definite subsutural cord; left side of base of body whorl only slightly concave, with a faint fasciole. Aperture oblong, greatest width median, labrum flattened medially, columella almost straight, parietal region concave, siphonal canal short, very broad, moderately shallow, oblique and slightly tapering, its termination shallowly indented dorsally; labial callus moderate, outer edge slightly free on columella, parietal nodule moderately small, laterally compressed, continuous with labrum, slightly constricting entrance to anal sinus; labrum fairly strongly convex in side-view, with a feeble stromboid notch and deep, moderately wide and asymmetrically U-shaped anal sinus, which is directed outwards, its lower border not alate.

Sculptured by thin, low, more or less suture-to-suture axial ribs, crossed by low but distinct spiral threads; growth-lines somewhat coarse, pliculate in places; body whorl with a broad but weak prelabral varix, overridden by the axial sculpture. Axial ribs somewhat irregular in places, weakly reversed-sigmoid, opisthocline, weak and strongly recurved below suture, on body whorl extending to columella/parietal junction, more or less equal to intervals, crests sharply rounded, sides gradually sloping; 1st whorl with 14 ribs, penultimate whorl with about 17. Spiral threads 6 on 1st whorl, where equal in strength; on penultimate whorl about 18, those on shoulder slope fine, except for the 2nd thread below suture which is angular; base of body whorl with 22 threads, those on rostrum relatively coarse, widely spaced and somewhat declivous.

Colour uniform light brown.

Protoconch narrowly domed, of about 2 whorls, initially small and depressed, 2nd whorl moderately convex, smooth except for growth-lines and about 6 spiral striae near termination, lip strongly arcuate, opisthocline; breadth 1,13 mm, height 1,05 mm (b/h 1,08).

Dimensions: 8,9 × 4,0 mm (holotype).

Operculum, radula and soft parts unknown.

Range: Continental shelf of eastern Transkei.

Type material: Holotype NM C7227/T3715, off Port Grosvenor (31°08,9′S, 30°15,7′E), 111 m, rocks; dredged *MN*.

Notes: The unique holotype somewhat resembles *T. falcicosta* (Barnard, 1958), but has a more oblong-quadrate body whorl and stronger spiral threads which cover the entire whorl. It is probably not a member of the genus *Tylotiella,* but no more appropriate genus is presently available.

Etymology: *quadratus* = quadrate (L.), alluding to the shape of the body whorl.

**Tylotiella sulekile** sp. n.

Figs 120–122

Diagnosis: Shell narrowly claviform (b/l 0,39–0,41, a/l 0,36), apex not blunt, base moderately long, slanting slightly to right; suture weakly or not undulating; whorls fairly strongly convex, with at most a very feeble shoulder, no subsutural cord or sulcus; fasciole present; siphonal canal relatively short and wide, labrum medially slightly flattened, columella slightly convex; parietal nodule very small, not constricting anal sinus, which is deep and asymmetrical, its lower border weakly alate, stromboid notch slight; axial ribs low, narrower than intervals, opisthocline, reaching suture below and more or less extending to suture above, 15–18 on penultimate whorl; spiral threads thin and low, developing only on later whorls (5 on penultimate whorl), becoming coarse and declivous on rostrum; body whorl with rib-like prelabral varix; glossy, uniform white or brownish-buff. Protoconch bluntly conical, breadth 0,88–0,90 mm. Attains 9,8 mm.

Description: Shell moderately small, narrowly claviform (b/l 0,39–0,41, a/l 0,36), apex not blunt, rostrum moderately long, base slanting slightly to right, squarely truncate; teleoconch whorls slightly over 5, suture shallow, weakly or not undulating; whorls fairly strongly convex, with at most a very slight shoulder, periphery at about mid-whorl, shoulder slope feebly to distinctly concave, no trace of subsutural cord; left side of base of body whorl shallowly concave, fasciole weak to moderate, no false umbilicus. Aperture oblong, greatest width at about posterior third, tapering gradually to siphonal canal, labrum medially slightly flattened, columella slightly convex, parietal region concave, siphonal canal moderately short, broad, fairly deep, oblique and slightly tapering, termination not indented; labial callus moderately thin, edge not free on columella, parietal nodule weak, forming a barely elevated pad, which does not constrict opening of anal sinus; labrum moderately convex in side-view, stromboid notch feeble, anal sinus deep,

openly and somewhat asymmetrically U-shaped, opening directed outward, its lower border weakly alate.

Sculptured by rather low axial ribs, crossed by weak, well-spaced spiral lirae, becoming coarse and declivous on rostrum; growth-lines fine; body whorl with a varix behind lip. Axial ribs weakening on shoulder slope, on body whorl extending to about columella/parietal junction, opisthocline, weakly reversed-sigmoid, narrower than intervals, crests angular to sharply rounded, sides gradually sloping; 1st whorl with 11 ribs, penultimate whorl with 15–18. Spiral lirae not apparent on early whorls, elsewhere narrow and barely raised, absent on shoulder slope, about 5 on penultimate whorl, 13–16 on base of body whorl.

Glossy, colour uniform light yellowish-brown to yellowish-white.

Protoconch bluntly conical, of about 2 whorls, 1st one small and depressed; evidently smooth, except for axial riblets near termination, lip weakly reversed-sigmoid; breadth 0,88–0,90 mm, height 0,85–0,88 mm (b/h 1,00–1,06).

Dimensions: 8,7 × 3,4 mm (holotype), 9,8 × 4,0 mm (paratype).

Operculum, radula and soft parts unknown.

Range: Continental shelf of southern Mozambique and Natal.

Type material: Holotype NM D4049/T3716, off Durban (29°50,2′S, 31°12,3′E), 95 m, fine, slightly muddy sand; dredged *MN*. Paratype NM J490/T3635, between Maputo and Zavora, *ex pisce,* C. Fernandes.

Notes: The holotype has been bored several times, but is the fresher shell. The Mozambican paratype (Fig. 122) differs from the holotype in its brownish-buff colouration, more concave shoulder slope and slight indication of a shoulder, but is certainly conspecific.

Etymology: *sulekile* = shiny, Zulu.

### **Orrmaesia** gen. n.

Type species *Orrmaesia dorsicosta* sp. n.

Diagnosis: Shell small (4–8 mm), claviform, with few (3–4) teleoconch whorls, rather blunt apex and short base, slanting slightly to right; no fasciole or false umbilicus, siphonal canal not or only slightly indented; anal sinus moderately deep, U-shaped (sometimes constricted at opening), parietal nodule small to large, stromboid notch absent or slight; whorls strongly convex, without shoulder, subsutural cord or sulcus; glossy, axial ribs rather low, suture-to-suture, spiral sculpture absent or restricted to rostrum, a single subterminal varix (dorsal or behind labrum). Protoconch narrowly domed, of 1½–2 whorls, smooth, except for growth-lines near termination. Operculum oblanceolate, with terminal nucleus. Radula lacking rachidians, laterals pectinate, strongly arched, marginals lanceolate, with short blade and (evidently) an accessory plate.

Notes: Members of this genus resemble miniature *Splendrillia,* but have suture-to-suture ribs and lack a rachidian plate.

Etymology: Named in honour of the late Virginia Orr Maes, for her important contributions to our knowledge of the Turridae, and for the valuable advice that she so freely gave to others such as myself. Gender of name feminine.

Key to southern African species of *Orrmaesia*

1 Varix situated on dorsum of body whorl ..... **dorsicosta**
— Varix situated behind lip ..... 2
2 Squat (b/l 0,45–0,53); suture crenulated; anal sinus relatively shallow and only slightly constricted; ribs with equally sloping sides; brownish-orange .. **nucella**
— Not squat (b/l 0,40–0,44); suture not crenulated; anal sinus deep and strongly constricted; ribs with leading face more concave than trailing face; pale yellowish ..... **ancilla**

**Orrmaesia dorsicosta** sp. n.

Figs 9, 123–127

Diagnosis: Shell narrowly claviform (b/l 0,37–0,43, a/l 0,35–0,40); suture rarely undulating; columella slightly convex; parietal nodule small to moderate, slightly constricting anal sinus, which is deep and asymmetrical, its lower border not distinctly alate; axial ribs wider than intervals, sides equally sloping, reaching suture below and more or less extending to suture above, 9–13 on penultimate whorl; rostrum smooth or with up to 6 spiral threads; body whorl with rib-like varix dorsally; slightly glossy, white or pale pink to pale orange-brown with paler ribs and sometimes spiral zones. Protoconch breadth 0,78–0,85 mm. Attains 7,8 mm.

Description: Shell small, narrowly claviform (b/l 0,37–0,43, a/l 0,35–0,40) with moderately blunt apex, rostrum moderately short, base slanting slightly to right, truncate, level; teleoconch whorls 4½, suture moderately deep; whorls fairly strongly convex, not shouldered, periphery at mid-whorl, slightly concave (at most) below suture, no trace of subsutural cord; left side of base of body whorl flattened to slightly concave, no fasciole or false umbilicus. Aperture narrowly pyriform, greatest width at posterior third, labrum medially gently curved, columella slightly convex, parietal region concave, siphonal canal short, broad, shallow, oblique and slightly tapering, termination not indented; labial callus moderately thin, edge not free on columella, parietal nodule small to moderately large, continuous with labrum, slightly constricting opening of anal sinus; labrum strongly convex in side-view, with slight stromboid notch and deep, asymmetricaly U-shaped anal sinus, which is directed slightly abapically, its lower border at most feebly alate.

Sculptured by low axial ribs and up to 6 inconspicuous spiral lirae (sometimes absent) on rostrum, faint spiral microstriae sometimes visible overall; growth-lines mostly fine but distinct; body whorl with a strong mid-dorsal varix. Axial ribs weak immediately below suture, generally just reaching it, on body whorl usually extending to mid-columella but sometimes ending at parietal level, evanescing from dorsal varix on, opisthocline, straight, wider than intervals, crests rounded, sides gently sloping; 1st whorl with 10–14 ribs, initially finer and more sloping, penultimate whorl with 9–13 ribs.

Colour usually moderate orange, ribs and rostrum often paler (pale orange-yellow to yellowish-white), sometimes with a diffuse, pale peripheral band; occasionally white overall; Natal form (from just south of Durban) moderate yellowish-pink or pale to light pink.

Protoconch narrowly domed, of about 1½ whorls, initially small and depressed,

2nd whorl moderately convex, smooth except for growth-lines near termination, lip weakly reversed-sigmoid; breadth 0,78–0,85 mm, height 0,68–0,75 mm (b/h 1,04–1,22).

Dimensions: 6,7 × 2,5 mm (holotype); 7,8 × 3,0 mm, 5,0 × 2,1 mm (largest and smallest adult paratypes).

Operculum resembling that of *Clavus unizonalis* (Fig. 5), but with terminal nucleus; relatively thick, brown.

Radula (Fig. 9): Marginal plates lanceolate, with short blade and evidently an accessory limb supporting base; lateral strongly arched with 9 prominent cusps; rachidian plate absent.

Tentacles short, eyes well-developed, on large basal swellings, end of tentacle subequal in length to basal swelling.

Range: Transkei to Zululand, continental shelf and upper slope, 50–390 m.

Type material (all NM: *MN*): Holotype NM C9487/T3744, off Whale Rock, Transkei (31°58,8′S, 29°16,8′E), 90 m, sponge-rubble, coarse sand, some rocks. TRANSKEI: Paratype 1, C7736/T3745, off Kei River, 390 m, coarse sand. Paratype 2, C7358/T3746, off Qolora River, 96 m, gorgonians, sponges. Paratype 3, C7647/T3747, off Stony Point, 90 m, calcareous debris, coarse sand. Paratype 4, C7471/T3748, off Mbashe River, 200–220 m, sponge-rubble. Paratype 5, C8011/T3749, off Qora River, 270 m, old shell-debris. Paratype 6, C6400/T3759, off Mendu Point, 250 m, coarse sand, rubble, few sponges. Paratypes 7–12, C6463/T3751, off Nqabara Point, 330–340 m, muddy sand, broken coral, shells. Paratype 13, C7538/T3752, off Nthlonyane, 95 m, sponge-rubble. Paratype 14, C7216/T3753, off Whale Rock, 150–200 m, sponge-rubble. Paratypes 15–20, C7294/T3742, off Whale Rock, 90 m, sponge-rubble, small pebbles. Paratypes 21–22, C8547/T3754, off Bulungula River, 300–370 m, coarse sand. Paratypes 23–24, C7541/T3755, C7710/T3756, off Ubombo, 60–62 m, coarse sand, shell conglomerate. Paratype 25, C7680/T3757, off Ubombo, 80 m, mixed sand and mud, shell debris. Paratypes 26–29, C7181/T3743, C7192/T3758, off Ubombo, 96 m, sand and gravel. Paratype 30, C7836/T3759, off Ntafufu River, 50 m, mud, sand. Paratypes 31–38, C7327/T3760, C7321/T3762, off Port Grosvenor, 80 m, worn calcareous nodules. Paratypes 39–42, C7291/T3763, off Port Grosvenor, 82 m, worn calcareous nodules. Paratype 43, C7768/T3764, off Port Grosvenor, 100–115 m, pebbles, some sand. Paratype 44, C7829/T3765, off Port Grosvenor, 80–85 m, calcareous nodules, sand. Paratype 45, C7775/T3766, off Mtamvuna River, 100 m, stones, rubble. Paratype 46, C5404/T3767, between Mtamvuna and Mzamba Rivers, 100 m, sponges. NATAL: Paratype 47, D232/T3771, off Park Rynie, 130 m. Paratype 48, D1132/T3768, off Umlaas Canal, 140 m, sand and pebbles. Paratypes 49–51, D1164/T3769, off Umlaas Canal, 150 m, muddy sand, fine pebbles. ZULULAND: Paratype 52, C1523/T3770, off Port Durnford, 110 m, A. Connell.

Notes: An abundant species on the continental shelf in 80–100 m, with fewer records from depths of 200 m or more. There are a number of samples in the NM collection in addition to the types. The species varies somewhat in proportions, in rib strength and number, in the development of basal lirae, and in colour. Even the

strength of the dorsal varix is slightly variable. The Umlaas Canal individuals differ from Transkei shells in their pink colour, but there appear to be no other differences. One sample (NM C7249, from off Whale Rock in 90 m) may represent a different species, in that its base is slightly more produced, the protoconch is slightly larger and more domed, and axial ribs are shorter (and in some individuals very weak).

In the only living example available, no rachidian plate could be discerned despite staining in Shirlastain A and mounting in polyvinyl lactophenol.

Etymology: *dorsum* (a back) + *costa* (a rib), L.

**Orrmaesia nucella** sp. n.

Figs 128–129

Diagnosis: Shell ovate-claviform (b/l 0,45–0,53, a/l 0,36–0,44); suture distinctly undulating; columella almost straight; parietal nodule moderately small, slightly constricting anal sinus, which is fairly shallow and asymmetrical, its lower border not alate, stromboid notch slight; axial ribs more or less equal to intervals, suture-to-suture, each rib with its sides equal in slope, 8–10 on penultimate whorl; rostrum smooth; body whorl with varicoid terminal rib; glossy, brownish-orange. Protoconch breadth 0,68–0,73 mm. Attains 4,2 mm.

Description: Shell ovate-claviform (b/l 0,45–0,53, a/l 0,36–0,44), with relatively large aperture, moderately sharp apex and rather produced base, whose left side slopes slightly to the right; suture moderately deep, undulating; teleoconch whorls just over three, each whorl strongly convex, without trace of angle or shoulder, periphery more or less median, no subsutural cord or sulcus; left side of base flat or slightly concave, without fasciole or false umbilicus. Aperture oblong-ovate, siphonal canal wide, its termination not dorsally indented; labrum evenly convex, columella almost straight, paries concave, outer edge of labial callus slightly free on columella and forming a moderate parietal pad at suture, slightly constricting anal sinus; labrum moderately convex in side-view, with a slight stromboid notch and a relatively shallow, asymmetrically U-shaped anal sinus, which is directed outward or slightly adapically and whose lower border is not alate.

Sculpture of fairly low, suture-to-suture axial ribs, rib preceding lip varicoid; no spiral sculpture, growth-lines strong. Axial ribs slightly opisthocline, evanescing on base between level of parietal nodule and columella-parietal junction, rather straight (except for a slight flexure below suture and another at basal termination), relatively weak below suture, crests strongly rounded in cross-section with equally steeply sloping sides, ribs more or less equal in width to intervals; 9–10 ribs on 1st whorl, 8–10 (including varix) on last.

Protoconch narrowly domed, of about $1\frac{3}{4}$ whorls, 1st one depressed; smooth, suture shallow; breadth 0,68–0,73 mm, height 0,48–0,55 mm (b/h 1,24–1,46).

Glossy, moderate or brownish-orange, usually uniform, rarely with paler spiral zones.

Dimensions: 3,80 × 1,85 mm (holotype); 3,1 × 1,65 mm; 4,15 × 1,85 mm (smallest and largest paratypes respectively).

Operculum, radula and soft parts unknown.

Range: Continental shelf of Transkei and southern Natal, 74–230 m.

Type material: Holotype NM C7290/T3772, off Port Grosvenor, Transkei (31°25,0'S, 29°56,6'E), 82 m, worn calcareous nodules. Paratype 1, NM D228/T3773, off Park Rynie, Natal, 130 m, sponge-rubble. Paratype 2, NM C7393/T3774, off Port Grosvenor, Transkei, 82 m, worn calcareous nodules. Paratypes 3–4, NM C7300/T3775, off Port Grosvenor, 80 m, calcareous nodules, lithothamnion sheets. Paratype 5, NM C7761/T3776, off Port Grosvenor, 95–100 m, coarse sand, gorgonians. Paratypes 6–7, NM C7315/T3777, off Port Grosvenor, 80 m, worn calcareous nodules. Paratype 8, NM C7185/T3778, off Ubombo, Transkei, 96 m, sand and gravel. Paratype 9, NM C7782/T3779, off Mncwasa Point, Transkei, 74 m, sand and rubble. Paratype 10, NM C7677/T3780, off Nthlonyane, Transkei, 220–230 m, sponges, gorgonians. Paratypes 11–12, NM C7467/T3781, off Mbashe River, Transkei, 200–220 m, sponge-rubble. Paratypes 13–14, NM C7592/T3782, off Sandy Point, 94 m, gorgonians, sponges. All dredged *MN*.

Notes: *O. nucella* closely resembles the shallower-water, more western *O. ancilla*, but is a more squat species (b/l 0,45–0,53 instead of 0,40–0,44), its axial ribs are straighter and less opisthocline and their leading face is not concave as in *ancilla*; the suture is distinctly crenulated, the anal sinus is much broader, shallower and less constricted at its opening, general colour is darker and the protoconch is less elevated.

Etymology: *nucella* = a little nut, L.

*Orrmaesia ancilla* (Thiele, 1925) **comb. n.**

Figs 130–132

*Drillia ancilla* Thiele, 1925: 194 (228), pl. 37 (25), fig. 10; Barnard, 1958: 121. Type locality: Agulhas Bank (33°50,5'S, 25°48,8'E and 35°26,8'S, 20°56,2'E), depth unknown.
*Mangilia innotabilis* Turton, 1932: 29, pl. 6, no 214. Type locality: Port Alfred.

Diagnosis: Shell ovate-claviform (b/l 0,40–0,44, a/l 0,36); suture not distinctly undulating; columella almost straight; parietal nodule large, strongly constricting anal sinus, which is deep and symmetrical, its lower border slightly alate; axial ribs low, slightly opisthocline, suture-to-suture, each rib with its leading face more concave than its trailing face, 8–9 on penultimate whorl; rostrum smooth; body whorl with varicoid terminal rib; glossy, pale yellowish. Protoconch breadth 0,70 mm. Attains 4,8 mm.

Description: Shell claviform (b/l 0,40–0,44, a/l 0,36) with moderately sharp apex and rather produced base, whose left side slopes slightly to the right; suture moderately deep, not undulating; teleoconch whorls 4, each whorl strongly convex, without trace of angle or shoulder, periphery more or less median, no subsutural cord or sulcus; left side of base not concave, without fasciole or false umbilicus. Aperture oblong-ovate, siphonal canal wide, its termination not dorsally indented or very slightly so; labrum evenly convex, columella almost straight, paries concave, outer edge of labial callus slightly free on columella and forming a heavy parietal pad at suture, strongly constricting opening of anal sinus; labrum moderately convex in side-view, with a slight stromboid notch and a deep, rather

symmetrically U-shaped anal sinus, which is directed outward, with its entrance constricted and its lower border slightly alate.

Sculpture of fairly low, suture-to-suture axial ribs, one rib preceding lip varicoid; no spiral sculpture, growth-lines strong. Axial ribs slightly opisthocline, evanescing on base at level of paries, reversed-sigmoid, relatively weak below suture, crests strongly rounded in cross-section, with steeply sloping sides, the leading face distinctly more concave than the trailing one, ribs more or less equal in width to intervals; 8–9 per whorl throughout.

Protoconch narrowly domed, of about $1\frac{3}{4}$ whorls (limits ill-defined), 1st whorl moderately depressed; smooth, suture shallow; breadth 0,70 mm, height 0,60–0,63 mm (b/h 1,11–1,17).

Glossy, uniform pale orange-yellow.

Dimensions: 4,75 × 2,1 mm (Thiele); 4,2 × 1,8 mm.

Operculum, radula and soft parts unknown.

Range: Agulhas Bank and eastern Cape littoral.

Locality records: AGULHAS BANK: East of Cape Agulhas and off Algoa Bay, depth? (Thiele). EASTERN CAPE: Port Alfred, littoral (Turton); off Cove Rock, East London, 22 fath. (SAM A8762: P.F.).

Type material: Syntypes (3) presumably in ZMB, syntypes of *M. innotabilis* in OUM.

Notes: Although Turton found over 20 specimens in beach-drift, I have seen no examples of this species from the shoreline.

### *Splendrillia* Hedley, 1922

*Splendrillia* Hedley, 1922: 250. Type species (o.d.) *Drillia woodsi* Beddome, 1883.

Diagnosis: Shell claviform, with short, truncate base, siphonal canal not notched, base sometimes with a fasciole; anal sinus deep, U-shaped, its opening usually more or less constricted by a parietal tubercle, stromboid notch usually present; body whorl sometimes with a dorsal or prelabral varix or hump; surface highly polished, with well-developed axial ribs, which evanesce below suture, but spiral sculpture absent or restricted to rostrum; subsutural cord weak or absent. Protoconch narrowly domed or bluntly conical, of $1\frac{1}{2}$–2 smooth whorls. Operculum oblanceolate, with terminal nucleus. Radula drilliine, with a very small rachidian, arched, pectinate lateral plates, and slender marginals.

Notes: *Splendrillia* is here used in a broad sense for drilliines in which spiral sculpture is absent or restricted to the rostrum (sometimes within the same species). In this sense the group may well prove to be polyphyletic, but at present information is inadequate for a final classification. Japanese authors treat *Splendrillia* as a subgenus of either *Elaeocyma* Dall, 1918, or *Cymatosyrinx* Dall, 1889, which are Western Hemisphere taxa differing in having the 2nd protoconch whorl carinate. Conversely, it is not impossible that *Splendrillia* will prove to be a tropical/subtropical subgenus of the cold-water genus *Spirotropis* Sars, 1878 (see Bouchet & Warén (1980) and Bernasconi & Robba (1984) for treatment of North

Atlantic/Mediterranean species). Southern African species such as *eva* (Thiele, 1925) and *kylix* sp.n. approach *Spirotropis* closely in shell characters.

Powell (1966: 83) characterised *Splendrillia s.s* by the presence of a subsutural cord, yet this seems scarcely developed in the type species of the genus, and I have not utilised this character. Of the two subgenera that he recognises, *Syntomodrillia* Woodring, 1928, is probably not closely related (see under *Tylotiella*). Finally, there is so much variation in form of the marginal plates among the radulae figured by Powell (1966: text figs. D78–80) for different species of *Splendrillia* that it appears likely that several supraspecific taxa are there involved.

The genus *Splendrillia* abounds on the upper continental slope off Transkei, and my dredgings have yielded a number of *species inquaerendae*, additional to species covered in the present paper, which cannot at present be satisfactorily resolved.

Key to southern African species of *Splendrillia*

1 Dorsum of body whorl prominently humped; protoconch very small (breadth *ca* 0,75 mm) ..... **mikrokamelos**
— Dorsum not prominently humped; protoconch diameter 0,80 mm or more 2
2 Large (attains 22 mm with 7 teleoconch whorls), protoconch diameter 1,20 mm or more ..... **daviesi**
— Small (not exceeding 12 mm for 5 teleoconch whorls), protoconch diameter 1,15 mm or less ..... 3
3 Dorsum of body whorl with low but distinct varix; rostrum thick; anal sinus directed slightly adapically ..... **sarda**
— Dorsum without definite varix; rostrum not thick; anal sinus not adapically directed ..... 4
4 Columella markedly convex, its base curved to left ..... **skambos**
— Columella not as above ..... 5
5 Axial ribs narrower than intervals, 8 on penultimate whorl; anal sinus strongly constricted, symmetrical ..... **falsa**
— Axial ribs wider than intervals, 10 or more on penultimate whorl; anal sinus not strongly constricted, asymmetrical ..... 6
6 Axial ribs reaching lower suture, which is crenulated; shoulder relatively weak **alabastrum**
— Axial ribs not reaching lower suture, which is not crenulated; shoulder strong ..... 7
7 Shoulder angle very acute; anal sinus strongly constricted; apical whorl of protoconch relatively small and tilted ..... **eva**
— Shoulder angle not sharp; anal sinus wide, barely constricted; apical whorl of protoconch relatively large and depressed ..... **kylix**

*Splendrilla falsa* (Barnard, 1958) **comb. n.**

Figs 133–134

*Drillia falsa* Barnard, 1958: 94, fig. 3a (radula), fig. 4a. Type locality: 'False Bay' [= 34°19'S, 18°30'E, 52 m].

Diagnosis: Shell claviform b/l 0,39, a/l 0,33), apex moderately blunt, body whorl somewhat obconic, base moderately short, straight; suture slightly undulating;

whorls strongly convex, scarcely shouldered, no subsutural cord or sulcus; no fasciole; siphonal canal moderate, labrum not medially flattened; outer edge of labial callus not raised; base of columella very slightly curved to left; parietal nodule large, markedly constricting anal sinus, which is deep and symmetrical, its lower border somewhat alate; axial ribs prominent, nodiform, slanting, gradually evanescing above shoulder but just reaching suture below, 8 on penultimate whorl; rostrum with about 9 weak spiral threads; body whorl without definite varix or hump, although penultimate rib is accentuated; pale buff. Protoconch narrowly domed, breadth 1,00 mm. Attains 9,4 mm.

Description: Shell claviform (b/l 0,39, a/l 0,33) with moderately blunt apex, relatively small aperture and moderately short base; teleconch whorls 5½; whorls becoming progressively more convex with growth, periphery initially at basal third of each whorl, later median and strongly projecting, evenly convex below periphery, concave above, so that there is a suggestion of a shoulder, no subsutural cord or definite sulcus; suture well inscribed, slightly undulating; left side of base of body whorl slightly concave, no distinct fasciole. Aperture narrowly pyriform, greatest width at posterior third, siphonal canal somewhat oblique, not indented; columella slightly convex, parietal region strongly concave; labrum thin, smooth, gently curved; labial callus thick, its outer edge not free, parietal tubercle large, fused with labrum, strongly constricting entrance of the deep, symmetrical, U-shaped anal sinus, which occupies most of shoulder slope and has a somewhat alate lower border; labrum evenly convex, stromboid notch slight.

Sculptured by prominent, somewhat tubercle-like axial ribs; penultimate rib (situated about a quarter-whorl behind lip) strong and slightly varicoid; spiral sculpture restricted to about 9 feeble lirae on rostrum and faint traces of microstriae below suture; growth-lines fairly coarse. Axal ribs gradually evanesce on shoulder slope but reach suture below, and on body whorl disappear below parietal level; opisthocline, slightly narrower than their intervals, crests sharply rounded in transverse section, with steeply sloping sides; 10 ribs on 1st whorl, 8 on later ones.

Colour [very] pale orange-yellow (faded?), protoconch slightly darker.

Dimensions: 9,4 × 3,7 mm (holotype).

Protoconch narrowly domed, of just over 1½ whorls, 1st whorl depressed but relatively large, suture shallow; evidently smooth, lip arcuate; breadth 1,00 mm, height 0,78 mm (b/h 1,28).

Operculum: 'oval, nucleus apical . . . . . amber' (Barnard).

Radula [based on Barnard's description and figure]: Rachidian plate tiny, with median cusp (and a weaker one on either side?); lateral plate evenly arcuate, pectinate, with 10–11 denticles, the median 5 markedly stronger than the others; marginal plate with short blade and somewhat hooked base; 34 rows of plates.

Range: Known only from the type locality.

Type material: Holotype SAM A30401, ex University of Cape Town, Ecological Survey No TRA. 139 J, dredged *Africana II*. Although Barnard merely cited 'False Bay', Ms S. Ozinsky has kindly traced the U.C.T. number for me, enabling the type locality to be more precisely restricted (see above). The holotype was dredged

on a bottom of sand, shells and large patches of the polychaete *Phyllochaetopterus* on flat rocks.

Notes: The unique holotype, although live-taken, is somewhat chalky (presumably from the effects of preservative) and shows no sign of the high gloss that normally characterises members of the genus *Splendrillia*. The species may be distinguished from its nearest congeners, *S. kylix*, *S. eva* and *S. alabastrum*, by its relatively few, more prominent, widely spaced and nodiform axial ribs, strongly convex but barely shouldered whorl-profile and relatively narrow aperture. Barnard's description and figure contain a number of inaccuracies.

### *Splendrillia eva* (Thiele, 1925)

Figs 135–136

*Drillia (Cymatosyrinx) eva* Thiele, 1925: 228 (194), pl. 37 (25), fig. 9; Barnard, 1958: 138, fig. 20 (right-hand figure). Type locality: 35°16′S, 22°26′E, 155 m.
*Splendrillia eva*; Powell, 1966: 84.

Diagnosis: Shell angularly claviform (b/l 0,37–0,42, a/l 0,33–0,40), apex relatively sharp, body whorl obconic, base moderately short, straight; suture not undulating; whorls with an acute, moderately sloping shoulder, no subsutural cord or sulcus; fasciole strong; siphonal canal relatively narrow, labrum medially slightly flattened; outer edge of labial callus slightly raised next to columella; columella straight; parietal nodule moderately large, strongly constricting anal sinus, which is deep and somewhat asymmetrical, its lower border weakly alate; axial ribs low, distinctly slanting, gradually evanescing above shoulder and barely reaching suture below, 10–13 on penultimate whorl; rostrum smooth; body whorl without definite varix or hump; glossy, greyish-white. Protoconch somewhat papilliform, 1st whorl small and tilted; breadth 0,80–1,00 mm. Attains 8,4 mm.

Description: Shell angularly claviform (b/l 0,37–0,42, a/l 0,33–0,40), with turreted spire, small aperture and distinctly produced, obliquely truncate rostrum; teleoconch whorls 5, strongly convex with angular shoulder, formed by abrupt termination of ribs above, shoulder slope smooth and strongly concave, suture moderately deep; left side of base of body whorl concave, fasciole strong. Aperture narrowly pyriform, greatest width at posterior third, siphonal canal wide, its termination not notched; labrum medially slightly flattened; parietal region evenly concave, columella rather straight; labial callus thick, forming a moderately strong parietal pad which slightly constricts entrance to anal sinus, outer edge of callus slightly raised next to columella; labrum thin, smooth, somewhat alate below anal sinus, strongly convex in side-view, with a distinct stromboid notch; anal sinus very deep, forming an asymmetrical 'U'.

Sculpture of strong axial ribs; no prelabral varix nor spiral sculpture; growth-lines coarse. Axial ribs straight, strongly opisthocline, wider than their intervals, terminating abruptly at shoulder and just reaching suture below, on body whorl obsolete at level of parietal/columella junction; in cross-section sharply rounded with steep sides, trailing side slightly concave; 9–10 on 1st whorl, increasing to 10–13 on last.

Glossy [greyish-] white.

Protoconch somewhat papilliform, of about 1¾ whorls, 1st whorl small and strongly tilted; smooth and porcellaneous; breadth 0,80–1,00 mm, height 0,75– 0,95 mm (b/h 0,94–1,13).

Dimensions: 7 × 2,5 mm (Thiele); 8,4 × 3,5 mm.

Range: Outer continental shelf and upper slope, from off Tsitsikamma coast to southern Natal, 155–446 m.

Locality data: TSITSIKAMMA COAST: off Cape St Blaize, 125 fathoms (SAM A8561). TRANSKEI: off Qolora River, 440–446 m, fine sand, stylasterids (NM C9861: *MN*). NATAL: off Melvill, 380–420 m, coarse, barren sand, sandstone (NM B8847: *MN*).

Notes: Thiele's description lacks detail and his figure appears to show a damaged lip. The present material apparently agrees satisfactorily, although only a comparison with the holotype (denied to South African workers) would permit certainty. Barnard's figure exaggerates the angularity of the shoulder. Although referred to *Cymatosyrinx* Dall, 1889, by Thiele, the protoconch is not keeled as in that group, and there is no subsutural cord.

**Splendrillia mikrokamelos** sp. n.

Figs 149–150

Diagnosis: Shell angularly claviform (b/l 0,42, a/l 0,32–0,34), apex sharp, body whorl somewhat obconic, dorsally humped, base short, bent to right; suture weakly undulating; whorls with an acute, moderately sloping shoulder, no subsutural cord or sulcus; fasciole strong; siphonal canal relatively narrow, labrum medially slightly flattened; outer edge of labial callus not raised; columella almost straight; parietal nodule moderate, strongly constricting anal sinus, which is deep, somewhat asymmetrical, and directed slightly adapically, its lower border weakly alate; stromboid notch well-developed; axial ribs strong, somewhat nodiform, gradually evanescing above shoulder but reaching suture below, 9 ribs on penultimate whorl; rostrum smooth; body whorl without a definite varix; glossy, translucent-orange, ribs paler at periphery. Protoconch rounded conical, breadth 0,75 mm. Attains 7,4 mm.

Description: Shell claviform (b/l 0,42, a/l 0,32–0,34), with relatively small aperture, sharp apex and turreted spire, siphonal canal short, bent to right, dorsum of body whorl humped; teleoconch whorls 5; 1st whorl gently convex, rest strongly shouldered, shoulder just above midwhorl, whorl profile gently convex to almost flat anteriorly, strongly concave above shoulder, rising slightly up preceding whorl but not forming a subsutural cord; left side of base of body whorl concave, with strong fasciole and slight false umbilicus. Aperture narrowly pyriform with greatest width at about posterior third, siphonal canal relatively deep, narrow and parallel-sided, not indented terminally; labrum medially slightly flattened; columella almost straight, parietal region concave; labial callus fairly thick, its outer edge not raised, forming a moderate parietal pad which somewhat constricts anal sinus; labrum strongly convex in side-view with well-developed stromboid notch and deep, somewhat asymmetrically U-shaped anal sinus, which is directed slightly adapically, its lower border weakly alate.

Sculptured by axial ribs only, terminating abruptly above shoulder, on body whorl initially nodiform and extending only to level of parietal region, but behind labrum continuing to base; opisthocline, crests strongly rounded with steep sides, trailing side slightly more concave than leading one; 1st whorl with growth-lines only, 2nd with 8 ribs, body whorl with 9; no actual varix, but dorsal ribs on body whorl more prominent than elsewhere; growth-lines fine.

Shiny, translucent moderate-orange, rostrum and ribs in peripheral area paler.

Protoconch rounded-conical, vitreous, limits ill-defined, but evidently about $1\frac{1}{2}$ whorls, 1st whorl low but rounded, suture shallow, smooth; breadth 0,75 mm, height 0,65–0,75 mm (b/h 1,00–1,15).

Dimensions: 6,2 × 2,6 mm (holotype); length 7,4 mm (largest paratype, lip broken).

Operculum, radula and soft parts unknown.

Range: Transkei continental shelf, 80–94 m.

Type material: Holotype NM C7590/T3802, off Sandy Point (32°40,3′S, 28°40,4′E), 94 m, gorgonians, sponges. Paratype 1, *MN* C7596/T3803, off Ubombo, 80 m, mixed sand and mud, shell debris; a juvenile. Paratype 2, NM C7322/T3804, off Port Grosvenor, 80 m, worn calcareous nodules. All dredged *MN*.

Notes: In its humped, angular shape, *S. mikrokamelos* is evidently allied to *S. laeta* (Hinds, 1843) and *S. lamberti* (Montrouzier, 1860) of the tropical Indo-Pacific, but is very much smaller and lacks spiral ridges on the rostrum.

Etymology: *mikros* (small) + *kamelos* (a camel), G.

**Splendrillia kylix** sp. n.

Figs 137–139

Diagnosis: Shell claviform (b/l 0,40–0,46, a/l 0,32–0,43), apex rather blunt, body whorl obconic, base moderately short, straight; suture not undulating; whorls with strongly sloping shoulder, no subsutural cord or sulcus; fasciole slight; siphonal canal relatively wide, labrum medially flattened; outer edge of labial callus (including parietal nodule) slightly raised; base of columella not curved to left; parietal nodule moderately large, only slightly constricting anal sinus, which is deep and rather wide, somewhat asymmetrical, its lower border rarely weakly alate; axial ribs low, distinctly slanting, gradually evanescing above shoulder and seldom reaching suture below, 10–16 on penultimate whorl; rostrum with up to 7 weak spiral threads, sometimes absent; body whorl without definite varix or hump; silky, greyish-white. Protoconch narrowly domed, breadth 0,90–1,08 mm. Attains 10,3 mm.

Description: Shell claviform (b/l 0,40–0,46, a/l 0,32–0,43), with rather blunt apex, obconic body whorl and moderately short, straight, slightly obliquely truncate base; teleoconch whorls just over 5, suture moderately deep, not distinctly undulating; whorls angularly convex, their periphery (which forms a strongly sloping shoulder) situated just above midwhorl on later whorls (median on early ones), whorl profile gently convex below periphery, concave above, without subsutural cord or sulcus; left side of base of body whorl gently concave, with slight

fasciole and feeble false umbilicus. Aperture oblong-pyriform with greatest width at about posterior third, siphonal canal moderately deep and wide, slightly oblique, termination not dorsally indented; labrum medially flattened, columella gently convex, parietal region concave, labial callus thick, its outer edge slightly free behind columella and parietal nodule; parietal nodule moderately large, continuous with labrum, slightly constricting anal sinus; labrum strongly convex in side-view, with a slight stromboid notch and deep, rather wide, asymmetrical U-shaped anal sinus.

Surface with a silky gloss; sculptured by low axial ribs, rostrum with up to about 7 spiral threads (sometimes absent); growth-lines fine; no definite prelabral varix but body whorl usually slightly humped about 0,25 whorl back from lip. Axial ribs opisthocline, very slightly arcuate, gradually evanescing on shoulder slope and seldom reaching suture below, slightly wider than intervals, crests in cross-section rounded with gently sloping sides; weak and irregular on later part of body whorl; 1st whorl with 8–10 ribs, penultimate with 10–16. Greyish-white.

Protoconch narrowly domed, of nearly 2 whorls, apical one depressed, rounded; smooth, lip weakly reversed-sigmoid; breadth 0,90–1,08 mm, height 0,75–1,00 mm (b/h 1,02–1,22).

Dimensions: 10,1 × 4,1 mm (holotype); 10,3 mm (lip broken) and 7,8 × 3,1 mm (largest and smallest paratype).

Operculum, radula and soft parts unknown.

Range: Continental slope of Western Transkei, 390–550 m.

Type material: Holotype NM C6621/T3740, off Shixini Point (32°31,6'S, 28°53,0'E), 500 m, muddy sand, coral rubble. Paratype 1, NM C8658/T3783, 550 m, sand, stones, broken *Dendrophyllia*. Paratypes 2–3, NM C9066/T3784, off Mbashe River, 450–500 m, coarse sand, some mud. Paratypes 4–5, NM C9874/T3785, same data as holotype. Paratypes 6–8, NM C4057/T3786, off Qolora River, 440–446 m, fine sand, broken *Dendrophyllia*. Paratype 9, NM C6911/T3787, off Kei River, 490–500 m, sandy mud. Paratypes 10–15, NM C7726/T3788, C7727/T3789, off Kei River, 390 m, coarse sand. All dredged *MN*.

Notes: In general appearance *Splendrillia kylix* most closely resembles members of the deep-water Atlantic/Mediterranean genus *Spirotropis* Sars, 1878, and may well prove congeneric. It particularly resembles *S. modiola* (De Cristofori & Jan, 1832) (= *Pleurotoma monterosatoi* Locard, 1897, *fide* Bernasconi & Robba, 1984) and *S. azorica* Bouchet & Warén, 1980, but differs in possessing shouldered axial ribs rather than a peripheral keel.

In the absence of live-taken examples it is uncertain whether the silky greyish-white appearance of the shell is natural.

Together with *kylix*, occur individuals (Figs 140–141) in which are combined the larger parietal tubercle and strongly constricted, less asymmetrical anal sinus of *eva*, with the protoconch form and weaker shoulder angle of true *kylix*. They do not grow as large as *kylix* (largest specimen 8,0 × 3,3 mm), and have a more curved outer lip, and an aperture that has its greatest width more or less median. The only live-taken example (body dried within shell) is [very] pale orange-yellow in colour. This material probably represents a species distinct from *kylix*, but differences are

not sharply defined and better series are required. Material examined (all TRANSKEI, NM: *MN*): off Kei River, 390 m, coarse sand (C5207); off Sandy Point, 450–498 m, fine sand and stones (C4126); off Mbashe River, 450–500 m, coarse sand, some mud (C9525); off Mendu Point, 450 m, fine muddy sand (C6314) and 405–420 m, fine sand (C4998); off Nthlonyane, 345–400 m, fine sand (C9234); off Whale Rock, 350 m, fine muddy sand (C9423).

Etymology: *kylix* = a drinking cup, G., referring to the shape of the body whorl.

**Splendrillia alabastrum** sp. n.

Figs 142–143

Diagnosis: Shell biconic-claviform (b/l 0,43–0,45, a/l 0,37–0,41), apex moderately sharp, body whorl obconic, base short, straight, termination slightly oblique; suture slightly undulating; whorls with slight, very slopingly angular shoulder, no subsutural cord or sulcus; fasciole slight; siphonal canal relatively narrow, labrum medially somewhat flattened; base of columella not curved to left; parietal nodule large, somewhat constricting anal sinus, which is deep, moderately wide and asymmetrical, its lower border not alate, stromboid notch slight; axial ribs low, slightly opisthocline, gradually evanescing above shoulder, but reaching suture below, 12–14 on penultimate whorl; about 7 distinct spiral threads on rostrum; body whorl without definite varix or hump; glossy, pure white. Protoconch bluntly conical; breadth 0,98–1,15 mm. Attains 8,7 mm.

Description: Shell biconic-claviform (b/l 0,43–0,45, a/l 0,37–0,41), with moderately sharp apex, obconic body whorl and short, straight, slightly obliquely truncate base; teleoconch whorls 5, suture moderately deep, slightly undulating; whorls fairly angularly convex, their periphery (which forms a slight, very strongly sloping shoulder) situated just above midwhorl on later whorls (median on early ones), whorl profile gently convex below periphery, concave above, without subsutural cord or sulcus; left side of base of body whorl gently concave, with slight fasciole and very feeble false umbilicus. Aperture oblong-pyriform with greatest width at about posterior third, siphonal canal moderately deep, relatively narrow, slightly oblique, termination not dorsally indented; labrum medially somewhat flattened, columella gently convex, parietal region concave, labial callus fairly thick, its outer edge not free; parietal nodule large, continuous with labrum, somewhat constricting anal sinus; labrum strongly convex in side-view, with a deep, moderately wide, asymmetrical U-shaped anal sinus, stromboid notch slight.

Surface polished; sculptured by axial ribs, rostrum with about 7 distinct spiral threads; growth-lines fine; no definite prelabral varix nor hump. Axial ribs slightly opisthocline, slightly arcuate, gradually evanescing on shoulder slope but reaching suture below (becoming obsolete at about parietal/columella junction), slightly wider than intervals, crests in cross-section rounded with gently sloping sides; weak and irregular on later part of body whorl; 1st whorl with 9–10 ribs, penultimate with 12–14. White.

Protoconch bluntly conical, of 2 whorls, apical one depressed, rounded; smooth, limits reversed-sigmoid; breadth 0,98–1,15 mm, height 0,85–1,05 mm (b/h 0,93–1,35).

Dimensions: 8,7 × 3,7 mm (holotype); 8,2 × 3,7 mm (paratype).
Operculum, radula and soft parts unknown.

Range: Continental slope of Transkei, 380–430 m.

Type material: Holotype NM C7601/T3790, off Rame Head (31°56,1'S, 29°26,5'E), 410–430 m, stones, some sand. Paratype 1, NM C2041/T3791, off Whale Rock, 400–420 m, coarse sand, old shell debris, stones. Paratype 2, NM C9843/T3792, Mzikaba River, 380–420 m, shells, hard bottom. All dredged *MN*.

Notes: Closely allied to *S. kylix*, but more biconical, with a sharper apex (caused by the more conical protoconch), a wider anal sinus, larger parietal nodule and axial ribs which continue below the suture, which they render very gently crenulated; also *alabastrum* is polished, pure white, rather than silky greyish-white.

Etymology: *alabastrum* = a container made of alabaster, L.

**Splendrillia skambos** sp. n.

Figs 144–148

Diagnosis: Shell claviform (b/l 0,40–0,45, a/l 0,32–0,40), apex relatively sharp, body whorl not obconic, base short, straight; suture sometimes distinctly undulating; whorls with a slight, very slopingly angular shoulder, no subsutural cord or sulcus; fasciole feeble or absent; siphonal canal relatively wide to narrow, markedly oblique, labrum not medially flattened; base of columella strongly curved to left; parietal nodule moderately large to large, strongly constricting anal sinus, which is deep, relatively narrow and somewhat symmetrical, its lower border slightly alate; axial ribs slightly opisthocline, straight, gradually evanescing above shoulder, but almost always reaching suture below, strong to weak, occasionally restricted on body whorl to a series of peripheral plicules; 10–14 axials on penultimate whorl; rostrum smooth or with spiral threads; body whorl without definite varix or hump; pale brownish-orange. Protoconch somewhat conical with rounded apex; breadth 0,90–0,95 mm. Attains 8,8 mm.

Description: Shell claviform (b/l 0,40–0,45, a/l 0,32–0,40), with relatively sharp apex, and short, straight, truncate base, body whorl not obconic; teleoconch whorls 5, suture moderately deep, only undulating in strongly-ribbed mud-dwelling form; whorls slightly angularly convex, their periphery (which forms a slight, very strongly sloping shoulder) situated at or just above midwhorl, whorl profile gently convex below periphery, concave above, without subsutural cord or sulcus; left side of base of body whorl only slightly concave, with at most a feeble fasciole and faint false umbilicus. Aperture narrowly oblong-pyriform with greatest width at about posterior third, siphonal canal moderately deep, relatively wide to narrow, markedly oblique, termination not dorsally indented; labrum medially gently curved, columella strongly convex, its base curved to left, parietal region concave, labial callus fairly thick, its outer edge only slightly free; parietal nodule usually moderately large (occasionally large), continuous with labrum, strongly constricting anal sinus, whose lower border is slightly alate in adult; labrum moderately convex in side-view, with a deep, relatively narrow, somewhat symmetrically U-shaped anal sinus, stromboid notch indistinct.

Sculptured by axial ribs, sometimes strong, sometimes weak, occasionally reduced to pleat-like nodules on periphery of last whorl; rostrum smooth, rarely with up to 8 spiral threads; growth-lines fine; no definite prelabral varix nor hump. Axial ribs slightly opisthocline, straight, gradually evanescing on shoulder slope but reaching suture below (usually becoming obsolete at about level of parietal nodule, occasionally restricted to periphery on last whorl); slightly wider than intervals, crests in cross-section strongly to weakly rounded with gently sloping sides; weak and irregular on later part of body whorl; 1st whorl with 9–11 ribs, penultimate with 10–14. Light orange-yellow (but faded).

Protoconch somewhat bluntly conical, with rounded apex, about $1\frac{2}{3}$ whorls, apical one slightly depressed, rounded; smooth, limits reversed-sigmoid; breadth 0,90–0,95 mm, height 0,75–0,93 mm (b/h 1,00–1,19).

Dimensions: 7,5 × 3,1 mm (holotype); 8,8 × 3,6 mm, 7,8 × 3,1 mm (paratypes).

Operculum, radula and soft parts unknown.

Range: Continental slope of Transkei, 380–420 m.

Type material: Holotype NM C2073/T3793, off Rame Head (31°57,3'S, 29°25,5'E), 380 m, coarse sand, old shell debris. Arenicolous form: Paratypes 1–7, NM C9873/T3794, same data. Paratypes 8–12, NM C7204/T3795, C1882/T3796, off Rame Head, 410–430 m, stones, some sand. Paratype 13, NM C9875/T3797, off Mendu Point, 405–420 m, fine sand. Limicolous form: Paratypes 14–25, NM C8875/T3798, off Mgazi River, 350 m, glutinous black mud, stones. Paratypes 26–28, NM C9196/T3799, off Mgazi River, 300 m, soft black mud. Paratypes 29–30, NM C8960/T3800, off Mgazi River, 250 m, muddy sand. Paratype 31, NM C6875/T3801, off Sandy Point, 450 m, muddy sand, stones. All dredged *MN*.

Notes: All available shells are rather old and dull, but the surface is presumably glossy or silky in life. Most examples of the typical arenicolous form (Figs 144–146) were dredged in a restricted area off Rame Head, together with *S. alabastrum*. The limicolous form came mainly from off the Mgazi area. In this form (Figs 147–148) the axial ribs are stronger and generally fewer (10–11 on penultimate whorl instead of 11–14), more angular at the periphery and render the suture distinctly undulating; the aperture is somewhat smaller (a/l 0,32–0,38, against 0,37–0,40 in the typical form) and narrower, particularly basally; the protoconch tends to be smaller (breadth 0,83–0,95 mm, height 0,75–0,80 mm (b/h 1,04–1,19) in mud-dwelling examples, as against breadth 0,90–0,95 mm, height 0,85–0,93 mm (b/h 1,00–1,09)). Finally, the limicolous form may grow slightly larger (largest example 8,8 mm, instead of 7,8 mm). There is some variation in degree of constriction of the anal sinus; in one specimen from mud the parietal nodule and opposing lip nearly meet. As a species, *Splendrillia skambos* may be distinguished at a glance from the related *S. kylix* and *S. alabastrum* by the more pronounced curvature of the base of the columella; the protoconch is also more conical in *S. skambos*. Although columella profile resembles that of *S. sarda*, the expanded columella callus in *skambos* ends well short of the base, whereas in *sarda* it continues to the tip of the rostrum.

Etymology: *skambos* = bent or crooked, G. (alluding to the columella).

**Splendrillia sarda** sp. n.

Figs 151–154

Diagnosis: Shell claviform (b/l 0,37–0,40, a/l 0,31–0,38), apex moderately blunt, body whorl oblong with thick rostrum, base short, straight; suture not undulating; whorls convex, slightly angular, without a distinct shoulder, no subsutural cord or sulcus; fasciole strong; siphonal canal relatively wide and markedly oblique, labrum slightly flattened medially; base of columella strongly curved to left; parietal nodule large, constricting anal sinus, which is deep, relatively narrow, somewhat asymmetrical, and directed slightly adapically, its lower border slightly alate; stromboid notch well developed; axial ribs slightly opisthocline to orthocline, straight to slightly curved, gradually evanescing above shoulder, but reaching suture below, low, somewhat nodiform; 9–11 axials on penultimate whorl; rostrum smooth; body whorl with inconspicuous hump-like varix about $\frac{1}{5}$ whorl back from labrum; highly glossy, brownish-orange to yellowish, with white ribs and rostrum. Protoconch somewhat conical with rounded apex; breadth 0,98–1,05 mm. Attains 11,2 mm.

Description: Shell claviform (b/l 0,37–0,40, a/l 0,31–0,38), with moderately blunt apex, and short, straight, broadly truncate base, body whorl oblong with thick rostrum; teleoconch whorls $5\frac{1}{2}$, suture moderately deep, not undulating; whorls convex, their periphery slightly angular, scarcely shouldered, situated at or just above midwhorl, whorl profile evenly convex below periphery, concave above, rising fairly high up previous whorl, but without subsutural cord or sulcus; left side of base of body whorl convex or slightly flattened, with a strong fasciole and shallow but distinct false umbilicus. Aperture narrowly oblong-pyriform with greatest width at about posterior third, siphonal canal moderately deep, relatively wide, markedly oblique, termination not dorsally indented; labrum medially slightly flattened; columella strongly convex, its base curved to left, parietal region concave, labial callus thick, its outer edge slightly free on columella; parietal nodule large, continuous with labrum, constricting anal sinus, whose lower border is slightly alate in adult; labrum moderately convex in side-view, with a deep, relatively narrow, somewhat asymmetrically U-shaped anal sinus, directed slightly adapically, stromboid notch strong and wide.

Surface glossy; sculptured by low, somewhat nodiform axial ribs; rostrum smooth; growth-lines fine; an inconspicuous humplike varix about one-fifth of body whorl back from lip. Axial ribs slightly opisthocline to orthocline, straight to slightly arcuate, gradually evanescing on shoulder slope but reaching suture below (usually becoming obsolete at or slightly above level of parietal nodule, occasionally restricted to periphery on last whorl); slightly wider than intervals, crests in cross-section moderately rounded with gently sloping sides; weak and irregular on later part of body whorl; 1st whorl with 8–10 ribs, penultimate with 9–11.

Colour moderate or strong orange to pale orange-yellow, with pale ribs and base, sometimes with a diffuse orange/yellow zone around rostrum.

Protoconch somewhat bluntly conical, with rounded apex, about $1\frac{1}{2}$ whorls, apical one slightly depressed, rounded, smooth, lip reversed-sigmoid; breadth 0,98–1,05 mm, height 0,80–0,88 mm (b/h 1,11–1,31).

Dimensions: 9,2 × 3,7 mm (holotype); 11,2 × 4,1 mm (largest but immature paratype).

Operculum, radula and soft-parts unknown.

Range: Outer continental shelf and upper slope of western Transkei, 200–300 m.

Type material: Holotype NM C9877/T3806, off Shixini Point (32°31,4'S, 28°51,9'E), 240 m, sand and old rubble. Paratype 1, NM C9878/T3807, same data, a juvenile. Paratype 2, NM C6564/T3808, off Mendu Point, 300 m, coarse sand. Paratype 3, NM C7466/T3809, off Mbashe River, 200–220 m, sponge-rubble. All dredged *MN*.

Notes: *Splendrillia sarda* is the most brightly coloured southern African member of the genus, although somewhat variable in depth of colour. Unfortunately in both adult types the post-varicoid part of the outer lip has been damaged and subsequently repaired by the mollusc, so that labral characters need confirmation.

Etymology: *sarda* = a semi-precious stone mentioned by Pliny, traditionally believed to refer to cornelian, L.

**Splendrillia daviesi** sp. n.

Figs 155–156

Diagnosis: Shell relatively large (attains 22 mm), narrowly claviform (b/l 0,32–0,37, a/l 0,34–0,37), apex moderately sharp, body whorl oblong with thick rostrum, base moderately produced, straight; suture not undulating; whorls with sloping shoulder, no subsutural cord or sulcus; fasciole strong; siphonal canal relatively wide, not markedly oblique, labrum slightly flattened medially; parietal nodule fairly small, slightly constricting anal sinus, which is deep, relatively narrow, somewhat asymmetrical, and directed slightly adapically, its lower border slightly alate; stromboid notch well-developed; axial ribs opisthocline, straight, evanescing above shoulder, barely reaching suture below, 12–15 axials on penultimate whorl; rostrum with 14–18 wavy spiral threads; body whorl without hump or varix; fairly glossy, light brownish-orange. Protoconch conical with tilted, raised apex; breadth 1,20–1,25 mm.

Description: Shell narrowly claviform (b/l 0,32–0,37, a/l 0,34–0,37), with high spire, moderately sharp apex, and fairly produced, straight, broadly truncate base, body whorl oblong with thick rostrum; teleoconch whorls 8, suture moderately shallow, not undulating; whorls convex, their periphery forming a rounded, sloping shoulder, median on early whorls, later situated at about one-third of each whorl below suture, whorl profile evenly convex below periphery, concave above, without subsutural cord or sulcus; left side of base of body whorl convex or slightly flattened, with a strong fasciole and distinct false umbilicus. Aperture narrowly oblong-pyriform with greatest width at about posterior third, siphonal canal moderately deep, relatively wide, slightly oblique, termination not dorsally indented; labrum medially slightly flattened; columella slightly convex, parietal region concave, labial callus thick, its outer edge slightly free on columella; parietal nodule fairly small, continuous with labrum, slightly constricting anal sinus, whose

lower border is slightly alate in adult; labrum moderately convex in side-view, with a deep, relatively narrow, somewhat asymmetrically U-shaped anal sinus, directed slightly adapically, stromboid notch strong and wide but shallow.

Surface fairly glossy; sculptured by low axial ribs; rostrum with about 14–18 fine, wavy spiral lirae, peripheral region sometimes with traces of microscopic spiral threads; growth-lines coarse; no hump or varix on body whorl. Axial ribs opisthocline, straight, evanescing on shoulder slope and barely reaching suture below (becoming obsolete at level of parietal nodule on last whorl); slightly wider than intervals, crests in cross-section strongly rounded with strongly sloping sides, the trailing face usually slightly more concave than leading one; weak and irregular on later part of body whorl; 1st whorl with 10–11 ribs, penultimate with 12–15.

Colour [very] light to moderate orange, protoconch pale.

Protoconch conical, of just over 2 whorls, apical one small, tilted and somewhat raised, smooth except for feeble growth-lines and a few very faint spiral striae near termination; lip weakly reversed-sigmoid; breadth 1,20–1,25 mm, height 1,30–1,40 mm (b/h 0,89–0,92).

Dimensions: 22,2 × 7,1 mm (holotype), 21,6 × 7,9 mm (largest paratype).

Operculum, radula and soft parts unknown.

Range: Continental slope of western Transkei, 250–500 m.

Type material: Holotype NM C2040/T3741, off Whale Rock (32°00,9′S, 29°21,8′E), 400–420 m, coarse sand, old shell debris, stones. Paratype 1, NM C2114/T3810, off Bulungula River, 250–270 m, muddy sand, old shell debris. Paratype 2, NM C6353/T3805, juvenile, off Shixini Point, 300 m, coarse sand, broken shell. Paratype 3, NM C6725/T3811, juvenile, off Qora River, 300 m, coarse sand, broken shell. Paratype 4, NM C6987/T3812, juvenile, off Qolora River, 290–300 m, fine muddy sand, broken shell. Paratypes 5–9, NM C9062/T3813, off Mbashe River, 450–500 m, coarse sand, some mud. All dredged *MN*.

Notes: *S. daviesi* lacks distinctive characters other than its relatively large size. There is a close but superficial resemblance to the subantarctic *Spirotropis limula* von Martens, 1904, as figured by Thiele (1925: pl. 37, fig. 3); that species lacks basal lirae, is white and has slightly more numerous ribs.

Etymology: Named in honour of the late Dr Oliver Davies (1905–1986), renowned archaeologist and classicist.

## *Agladrillia* Woodring, 1928

*Agladrillia* Woodring, 1928: 157. Type species (o.d.) *Agladrillia callothyra* Woodring, 1928.

Diagnosis: Shell small to moderate, clavate-fusiform, base strongly constricted, with relatively long, slightly obliquely truncate siphonal canal, flaring sightly towards end; anal sinus deep, U-shaped, constricted by a moderate to large parietal pad, stromboid notch distinct; subsutural cord fairly strong (sometimes nodose) to absent; axial ribs strong, sometimes suture-to-suture, sometimes ending at shoulder, spiral sculpture variable; lip usually preceded by a varix. Protoconch of 2–3 smooth whorls. Radula drilliine, but lacking rachidians.

Notes: The occurrence of this supposedly Western Hemisphere genus in southern Africa is open to confirmation. However, the two local species here described agree in principle shell characters with several West American species. Powell (1966) accepted only one Recent species (subsequently transferred by McLean (1971b) to *Kylix* Dall, 1919) as belonging to the genus, plus a second species referable to subgenus *Eumetadrillia* Woodring, 1928. McLean in Keen (1971) recognised five species from tropical West America. *Eumetadrillia* was proposed for species of *Agladrillia* in which the ribs stop at the shoulder and the subsutural cord and spiral sculpture are absent. These differences appear to be bridged in some of the eastern Pacific species treated by McLean. Radulae were figured by McLean (1971a) and described by Shimek & Kohn (1981).

One of the species tentatively referred here to *Agladrillia*, namely *Mangilia benjamini* Bartsch, 1915, may prove to be unrelated, indeed perhaps raphitomine. It is known only from the holotype, which lacks a protoconch. Although there is a close resemblance in general appearance to one of my new species (*A. ukuminxa*), *benjamini* differs markedly in its microshagreen sculpture and pliculate lip margin.

*Agladrillia oyamai* Shuto, 1965, from the Pleistocene of Japan, appears to be referable to the mangeliine genus *Paraclathurella* Boettger, 1895.

Key to southern African species of *Agladrillia*

1 Interstices with microscopic granules; outer lip plicate inside; parietal pad forming a median nodule ..... **benjamini**
— Without microscopic granules or labral ridges, parietal pad terminal ..... 2
2 Base strongly constricted, with narrow, squarely truncate siphonal extremity, no fasciole; 13–17 spiral threads on penultimate whorl; lip preceded by a varix **ukuminxa**
— Base moderately constricted, with fairly broad, obliquely truncate siphonal canal, fasciole well-developed; 28–31 spiral threads on penultimate whorl; no varix ..... **piscorum**

**Agladrillia ukuminxa** sp. n.

Figs 157–158

Diagnosis: Shell small (9 mm), b/l 0,38–0,40, a/l 0,41–0,43, whorls markedly convex, strongly impressed below suture, with a distinct but rounded shoulder, periphery median on early whorls, at posterior third on later ones; siphonal canal rather long and narrow, its tip squarely truncate, with only a slight notch; fasciole absent, anal sinus moderately deep, directed slightly adapically, parietal pad low, ridge-like, extending length of paries; labrum smooth inside; subsutural cord absent; axial ribs strongly opisthocline, terminating at shoulder slope, 9–10 on penultimate whorl, not nodulose, spiral lirae even and close-set, 13–17 on penultimate whorl, no intermediary or microspiral threads, nor microshagreen sculpture; a single varix behind lip. Uniform yellowish-white. Protoconch somewhat conical, of about 2 whorls, breadth 0,80 mm.

Description: Shell fusiform (b/l 0,38–0,40, a/l 0,41–0,43), with moderately long, tapering, squarely truncate siphonal rostrum, bent slightly to right, and a relatively

low spire, suture fairly shallow, sometimes slightly undulating; teleoconch whorls about 5½; whorls convex, periphery median on early whorls, later whorls with periphery about ⅓ whorl below suture, with terminations of axial ribs forming a slight shoulder; shoulder slope gently concave, without a shoulder sulcus or subsutural cord, although rising fairly high up preceding whorl; left side of base of body whorl slightly concave, fasciole absent, with a slight false umbilicus. Aperture narrowly pyriform, with greatest width at about posterior third, siphonal canal wide, flaring slightly towards end, its termination only slightly oblique and barely notched; labial callus fairly thin, its outer edge slightly free on columella, forming a low, ridge-like pad which extends length of parietal region and slightly constricts anal sinus; columella only slightly convex; labrum angular (?alate) at lower border of anal sinus, inner edge smooth; anal sinus moderately deep, rather broadly and openly U-shaped, directed slightly adapically.

Sculptured by strong axial ribs, crossed by narrow spiral lirae which are of uniform strength, without intermediaries or microspiral threads, growth-striae thread-like but very fine and visible mainly between spirals; a single varicoid rib just behind lip. Axial ribs obsolete above shoulder, except for an occasional rib which extends to suture on early whorls, on body whorl reaching upper part of rostrum; ribs strongly opisthocline, slightly wider than intervals, crests sharply rounded in cross-section, with trailing slope steeper than leading one; about 7 ribs on 1st whorl (sometimes feeble), 9–10 on penultimate one. Spiral lirae flattened and close-set, about 8 feeble threads on 1st whorl, on penultimate whorl 8–10 below shoulder, 5–7 thinner lirae above shoulder, base of body whorl with about 21 lirae.

Colour uniform yellowish-white.

Protoconch somewhat conical, of about 2 convex, vitreous whorls, first one relatively small and tilted, smooth, lip reversed-sigmoid; breadth 0,80 mm, height 0,90 mm (b/h 0,89).

Dimensions: 8,7 × 3,5 mm (holotype), 9,3 × 3,5 mm (paratype).

Operculum, radula and soft parts unknown.

Range: Outer continental slope of western Transkei, 100–165 m.

Type material: Holotype NM C7487/T3624, off Whale Rock (32°01,7′S, 29°18,2′E), 150–165 m, coarse sand, discoid corals. Paratype, NM C4824/T3625, off Qora River, 100 m, coarse sand, some sponge. Both dredged *MN*.

Notes: Somewhat resembling *Agladrillia gorgonensis* McLean & Poorman, 1971, from Colombia but markedly broader.

Etymology: *ukuminxa* = a constriction (Xhosa), referring to the markedly constricted rostrum and subsutural area.

**Agladrillia piscorum** sp. n.

Figs 159–160.

Diagnosis: Shell moderately small (12,6 mm), b/l 0,36–0,37, a/l 0,33–0,42, whorls markedly convex, strongly impressed below suture, with a distinct but rounded

shoulder, periphery at basal third on early whorls, more or less median on later ones; siphonal canal moderately long and rather broad, its tip obliquely truncate, with only a slight notch; fasciole distinct, anal sinus moderately shallow, directed outward, inside of lip not pliculate; parietal pad weak to moderate, not ridge-like, situated in posterior angle of aperture; subsutural cord absent; axial ribs strongly opisthocline, terminating on shoulder slope, 10–11 on penultimate whorl, not nodulose, spiral lirae even and close-set, 28–31 spirals on penultimate whorl, no intermediary or microspiral threads, nor microshagreen sculpture; no varices. Uniform white. Protoconch somewhat conical, of slightly under 2 whorls, breadth 0,93–1,03 mm.

Description: Shell claviform (b/l 0,36–0,37, a/l 0,33–0,42) with moderately long, tapering, obliquely truncate siphonal rostrum, bent very slightly to right, suture fairly shallow, sometimes slightly undulating; teleoconch whorls about 6; whorls convex, periphery at lower third on early whorls, more or less median on later whorls, with terminations of axial ribs forming a distinct shoulder; shoulder slope gently to strongly concave, without a shoulder sulcus or subsutural cord, although rising fairly high up preceding whorl; left side of base of body whorl concave, with fairly strong fasciole and a narrow but distinct false umbilicus. Aperture narrowly pyriform, with greatest width at about posterior third, siphonal canal wide, flaring slightly towards end, its termination markedly oblique and barely notched; labial callus fairly thin, its outer edge not free, forming a weak to moderate pad in posterior angle of aperture, not constricting anal sinus; columella only slightly convex; labrum gently convex, without a stromboid notch, not angular at lower border of anal sinus; anal sinus moderately shallow, rather openly U-shaped, directed outwards.

Sculptured by strong axial ribs, crossed by narrow spiral lirae, of uniform strength, without intermediaries or microspiral threads, growth-striae somewhat thread-like but very fine and inconspicuous; no varices. Axial ribs suture-to-suture on early whorls, on later ones becoming obsolete above shoulder, and on body whorl reach upper part of rostrum; ribs strongly opisthocline, slightly wider than intervals, crests roundedly angular in cross-section, with steep sides; 9–10 ribs on 1st whorl, 10–11 on penultimate one. Spiral lirae dense, 6–8 close-set threads on 1st whorl, becoming relatively less close on later whorls, on penultimate whorl totalling 28–31, those above shoulder usually finer, base of body whorl with about 26–33 lirae.

Uniform chalky white.

Protoconch somewhat conical (similar in form to that of *A. ukuminxa*), of slightly under 2 convex, vitreous whorls, first relatively small and tilted, smooth except for growth-lines and feeble spiral striae near termination, lip somewhat reversed-sigmoid; breadth 0,93–1,03 mm, height 1,05–1,23 mm (b/h 0,83–0,89).

Dimensions: 12,6 × 4,5 mm (holotype), 11,4 × 4,2 mm (paratype), lip more or less chipped in all examples.

Operculum, radula and soft parts unknown.

Range: Agulhas Bank, depth unknown.

Type material: Holotype NM B1009/T3620, off Cape St Blaize area, from gut of

spinenose horsefish *Congiopodus spinifer* (Smith, 1839), R. Le Maitre. Paratypes 1–10, NM A4074/T3621, same data. Paratype 11, B4043/T3622, same data.

Notes: Differs from *A. ukuminxa* in shape, dimensions, more numerous spiral lirae, lack of a varix, and non ridge-like, terminal parietal pad. Apart from the differences given under genus, *A. piscorum* differs from *A. benjamini* (Bartsch, 1915) in shape (whorls more shouldered and base less contracted) and in having fewer axials and more numerous spirals.

Etymology: *piscorum* = of fishes, referring to the source of the type material.

### *Agladrillia benjamini* (Bartsch, 1915) **comb. n.**

Figs 161–162

*Mangilia benjamini* Bartsch, 1915: 26, pl. 7, fig. 5. Type locality: False Bay.

Diagnosis: Shell moderate (14,6 mm), b/l 0,38, a/l 0,42, whorls markedly convex, strongly impressed below suture, with a distinct but rounded shoulder, periphery median; siphonal canal rather long and narrow, its tip slightly obliquely truncate, unnotched; fasciole absent, anal sinus moderately deep, with somewhat parallel sides, parietal pad a small, angular nodule, at mid-paries; labrum with about 13 irregular ridges inside; subsutural cord absent; axial ribs opisthocline, terminating at shoulder slope, 11 on penultimate whorl, not nodulose, spiral lirae even, 17 on penultimate whorl, no intermediary or microspiral threads, but distinct microscopic granules in intervals and below suture; a single varix behind lip. Uniform yellowish-white.

Description: Shell fusiform (b/l 0,38, a/l 0,42), with moderately long, tapering, slightly obliquely truncate siphonal rostrum, bent slightly to right, and a relatively high spire, suture fairly shallow, slightly undulating; teleoconch whorls about $8\frac{1}{2}$; whorls convex, periphery more or less median, with terminations of axial ribs forming a slight shoulder; shoulder slope gently concave, without a shoulder sulcus or subsutural cord; left side of base of body whorl moderately concave, fasciole absent, without a false umbilicus. Aperture narrowly pyriform, with greatest width at about posterior third, siphonal canal wide, flaring slightly towards end, its termination only slightly oblique and not notched; labial callus fairly thin, its outer edge barely free on columella, forming a small, angular nodule situated about halfway down parietal region, not constricting anal sinus; columella only slightly convex; inner margin of labrum with about 13 short, irregular ridges; anal sinus rather deep, U-shaped with somewhat parallel sides, directed outwards.

Sculptured by strong axial ribs, crossed by narrow spiral lirae which are of uniform strength, without intermediaries or microspiral threads; interstices and entire subsutural region with microscopic pustules; a single low varicoid rib immediately behind lip. Axial ribs evanescing abruptly above shoulder, less abruptly on early whorls, on body whorl reaching upper part of rostrum; ribs moderately opisthocline, slightly wider than intervals, crests rounded in cross-section, sides moderately steep; about 9 ribs on 1st whorl, 11 on penultimate one. Spiral lirae flat-topped, more or less equal to their interstices, 3 threads on lower half of 1st whorl, on penultimate whorl 14 below shoulder, 5 thinner lirae above

shoulder, base of body whorl with about 28 lirae, those on rostrum close and rounded.

Colour uniform yellowish-white.

Protoconch unknown.

Dimensions: 14,6 × 5,6 mm (holotype).

Type material: Holotype USNM 210.

Notes: The cited type locality requires confirmation. Although supposedly dredged in False Bay by the North Pacific Exploring Expedition during its visit in 1853, the species has not been seen subsequently at that locality, and the aperture of the shell contains fine mud, not sand as one would expect for the area (cf. Johnson (1964: 20) for the relevant extract from Stimpson's journal).

**Acinodrillia** gen. n.

Diagnosis: Shell small (length 7–12 mm), claviform, sometimes somewhat biconic, with blunt apex and moderately long base, sloping slightly to right, almost squarely truncate; aperture tapering gradually to siphonal canal, which is wide and unnotched; whorls not distinctly shouldered, without subsutural cord or sulcus, although sutural border sometimes slightly swollen; fasciole weak or absent; anal sinus deep, more or less symmetrically U-shaped, directed slightly abapically, parietal nodule small, barely constricting anal sinus; terminal varix weak or absent; sculptured by suture-to-suture axial ribs, incised by deep spiral grooves into nodules or lozenges; axial ribs extending onto rostrum, close-set, fine to coarse, sometimes flattened; colour brown to white. Protoconch narrowly domed, of 1½–2 smooth whorls, limits sharply defined and reversed sigmoid. Operculum and radula unknown.

Notes: Members of this genus somewhat resemble *Tylotiella*, but possess deep spiral grooves which cut the axial ribs into conspicuous nodules or granules. At first sight, *Acinodrillia paula* (Thiele, 1925) appears to be a discrepant element in its sculpture of axial sulci, intersected by spiral sulci only on the base of the body whorl, their intersection forming flattened lozenges rather than raised tubercles. However, an undescribed species (see under *A. paula*) exhibits an intermediate character-state.

Etymology: *acinus* (a berry) + *drillia*, L., feminine.

Key to species of *Acinodrillia*

1 Sculptured by axial grooves, on base of body whorl cut by spiral grooves, forming flat lozenges ..... **paula**

— Sculptured by raised axial ribs, cut into nodules or granules by spiral grooves, from shoulder slope down ..... 2

2 White; axial ribs strong, 13–15 on later whorls, with relatively large, coarse nodules (4–5 rows on penultimate whorl) ..... **viscum**

— Brown; axial ribs fine, 26–28 on later whorls, with small nodules (7–9 rows on penultimate whorl) ..... **amazimba**

*Acinodrillia paula* (Thiele, 1925) **comb. n.**

Figs 167–169

*Pleurotoma? paula* Thiele, 1925: 195(229), pl. 25(37), fig. 1. Type locality: off Tsitsikamma coast (35°16,O'S, 22°26,7'E), 155 m.

Diagnosis: Shell claviform (b/l 0,39–0,40, a/l 0,33–0,42), apex moderately blunt; whorls gently convex, without trace of shoulder, feebly concave posteriorly, without any swelling at suture; fasciole weak or absent; siphonal canal relatively long; parietal nodule moderately small, not markedly compressed, anal sinus parallel-sided; dominant sculpture sharply incised, of suture-to-suture, reversed-sigmoid grooves, the intervening axial 'ribs', which number 18–22 on penultimate whorl, being almost completely flat; on base of body whorl incised by 5–8 spiral sulci, forming rectangular nodules; body whorl without a varix; patterned by a diffuse median zone of pale orange-brown. Protoconch breadth 1,05–1,20 mm. Attains 11,8 mm.

Description: Shell claviform (b/l 0,39–0,40, a/l 0,33–0,42) with moderately blunt apex, rostrum relatively long, base slanting slightly to right, moderately truncate, slightly oblique; teleoconch whorls 4½, suture shallow, its lower border nicked by ends of axial grooves; whorls gently convex, not shouldered, periphery between mid-whorl and basal third, each whorl very slightly concave posteriorly, no trace of subsutural cord; left side of base of body whorl flattened to slightly concave, fasciole weak or absent, adult with slight false umbilicus next to columella callus. Aperture narrowly pyriform, greatest width more or less median, base of columella slightly convex, parietal region concave, siphonal canal moderately produced, broad, deep and slightly oblique, its termination not indented; labial callus fairly thick, its outer edge slightly free on columella, parietal nodule moderately small, continuous with labrum, slightly constricting opening of anal sinus; labrum fairly strongly convex in side-view, apparently without stromboid notch; anal sinus deep, symmetrically U-shaped, with parallel sides, its lower border not alate.

Sculptured by flat, reversed-sigmoid axial ribs, visible only by the narrow, sharply incised grooves which separate them, base of body whorl with 5–8 slightly deeper spiral grooves; faint spiral micro-striae sometimes visible above periphery; growth-lines fine; body whorl without a varix. Axial 'ribs' suture-to-suture, extending to tip of rostrum, although cut by basal grooves into small, rectangular nodules, opisthocline, strongly and arcuately recurved below suture; ribs fine and irregular on 1st whorl, penultimate whorl with 18–22 ribs.

Colour moderate orange-yellow, usually concentrated into a median zone on a pale ground.

Protoconch narrowly domed, of 1½–2 whorls, shape somewhat variable, evidently smooth, lip sharply defined, reversed-sigmoid; breadth 1,05–1,20 mm, height 1,00–1,25 mm (b/h 0,96–1,05).

Dimensions: 10,3 × 4,0 mm, 10,8 × 4,2 mm; attains 11,8 mm (lip broken).

Operculum, radula and soft parts unknown.

Range: Agulhas Bank.

Locality data: AGULHAS BANK: Off Cape St Blaize, *ex pisce* (NM A4078: R. Le Maitre); off False Bay area, *ex pisce* (NM A4028: R. Le Maitre).

Type material: Holotype presumably in ZMB.

Notes: This species was based on a broken juvenile of 6,3 mm length, which was referred to *'Pleurotoma'* by its describer 'only with strong doubt'. The adults now available, although mostly in poor condition, show it to be an undoubted turrid. Its distinctive sculpture is strongly suggestive of *Tropidoturris scitecostata* (Sowerby, 1903) (*q.v.* Kilburn 1986), but the parietal pad and the form of the anal sinus are clavine. A juvenile from 100 m off Cape Morgan (NM B7128) represents a closely-allied but undescribed species, in which the intervals between the sinuous axial grooves are raised into genuine if low ribs, incised by spiral grooves that are not restricted to the base as in *paula*, but extend from the shoulder slope anteriorly, and form weak nodules.

For the SAM material regarded by Barnard (1958: 127, fig. 12a) as 'possibly . . . conspecific' with *A. paula*, see *Inkinga platystoma* (Smith, 1877).

**Acinodrillia viscum** sp. n.

Figs 165–166

Diagnosis: Shell claviform (b/l 0,42–0,43, a/l 0,40–0,46), apex moderately blunt; whorls convex, feebly shouldered, shallowly concave below suture, slightly swollen at suture itself; fasciole absent; siphonal canal relatively long; parietal nodule moderately small, laterally compressed, entrance to anal sinus slightly constricted; axial ribs strong, 13–15 on penultimate whorl, incised into rounded, plano-convex nodules (4–5 rows on penultimate whorl) by deep spiral grooves; body whorl with a weak varix; greyish-white. Protoconch breadth 0,80–0,85 mm. Attains 8,9 mm.

Description: Shell claviform (b/l 0,42–0,43, a/l 0,40–0,46) with moderately blunt apex, rostrum relatively long, base slanting slightly to right, moderately truncate, slightly oblique; teleoconch whorls about $4\frac{1}{2}$, suture fairly shallow; whorls convex, feebly shouldered, periphery slightly above median, slightly concave below suture, very slightly swollen immediately below suture, but no distinct subsutural cord; left side of base of body whorl gently and evenly concave, fasciole absent, adult with slight false umbilicus next to columella callus. Aperture narrowly pyriform, greatest width slightly behind median, base of columella slightly convex, parietal region concave, siphonal canal moderately produced, broad, deep and slightly oblique, its termination not indented; labial callus fairly thick, its outer edge slightly free on columella, parietal nodule moderately small, laterally compressed with free outer edge, continuous with labrum, slightly constricting opening of anal sinus; labrum moderately convex in side-view, without stromboid notch; anal sinus deep, more or less symmetrically U-shaped, with its opening slightly narrowed.

Sculptured by fairly strong, rounded, close-set axial ribs, cut into conspicuous nodules by deep spiral grooves, except on shoulder slope; growth-lines fine, sometimes forming feeble arcuate plicules on shoulder slope; a weak varix shortly behind lip. Axial ribs suture-to-suture, extending (as nodules) well onto rostrum, much wider than intervals, strongly rounded in t/s with steep sides, slightly opisthocline, rather straight, except below suture, where somewhat recurved;

11–12 on 1st whorl, 13–15 on penultimate whorl. Nodules slightly elongated transversely, adapical face of each nodule flattened, abapical side convex; feeble on first whorl, 3 rows on 2nd, 4–5 on penultimate whorl, 7–9 on base of body whorl. Greyish-white.

Protoconch narrowly domed, of about 1½ smooth whorls, 1st whorl depressed, termination reversed-sigmoid, forming a rib; breadth 0,80–0,85 mm, height 0,80–0,85 mm (b/h 0,94–1,06).

Dimensions: 7,2 × 3,1 mm (holotype); largest paratype 8,9 mm long (lip broken).

Operculum, radula and soft parts unknown.

Range: Outer continental shelf of eastern Transkei, 100–180 mm.

Type material: Holotype NM C7436/T3717, off Mgazi River (31°44,7'S, 29°33,7'E), 180 m, soft mud. Paratypes 1–10, NM C7278/T3540, same data as holotype. Paratypes 11–14, NM C1300/T3541, off Port Grosvenor, 100–115 m, sand, some mud, solitary corals, shells. All dredged *MN*.

Notes: The freshest examples (although all have damaged lips) were dredged at the Port Grosvenor station. The sculpture of this species is distinctive.

Etymology: from *Viscum album* Linne, the European mistletoe, whose berries are somewhat reminiscent of the white nodules of this species.

**Acinodrillia amazimba** sp. n.

Figs. 163–164

Diagnosis: Shell biconic-claviform (b/l 0,42, a/l 0,40–0,43), apex blunt; whorls moderately convex, not shouldered, shallowly concave below suture, slightly swollen at suture itself; fasciole absent; siphonal canal relatively short; parietal nodule small, laterally compressed, entrance to anal sinus slightly constricted; axial ribs rather fine and low, 26–28 on penultimate whorl, incised into small rhomboidal nodules (7–9 rows on penultimate whorl) by deep spiral grooves; body whorl without a varix; uniform orange-brown. Protoconch breadth 1,13 mm. Attains 9,5 mm.

Description: Shell biconic-claviform (b/l 0,42, a/l 0,40–0,43) with blunt apex, rostrum relatively long, base slanting slightly to right, squarely truncate; teleoconch whorls about 4, suture fairly shallow; whorls moderately convex, not shouldered, periphery slightly above median, slightly concave below suture, very slightly swollen at sutural margin, but no distinct subsutural cord; left side of base of body whorl weakly to moderately concave, fasciole absent, with slight false umbilicus next to columella callus. Aperture narrowly pyriform, greatest width slightly behind median, tapering gradually to siphonal canal; base of columella slightly convex, parietal region concave, siphonal canal rather short, broad, deep and slightly oblique, its termination not indented; labial callus fairly thick, its outer edge slightly free on columella, parietal nodule rather small, laterally compressed with free outer edge, continuous with labrum, very slightly constricting opening of anal sinus; labrum fairly strongly convex in side-view, without stromboid notch;

anal sinus deep, more or less symmetrically U-shaped, with its opening slightly narrowed.

Sculptured by thin, rather low, close-set axial ribs, cut into small nodules by deep spiral grooves, except on shoulder slope; growth-lines strong, pliculate below suture and somewhat lamellate on rostrum; no varices. Axial ribs suture-to-suture, but on later whorls becoming relatively weak below suture, extending (as nodules) well onto rostrum, wider than intervals, strongly rounded in t/s with trailing side steeper than leading one; opisthocline, slightly arcuate, recurved below suture; 18–20 on 1st whorl, 26–28 on penultimate whorl. Nodules square to rectangular, but slightly oblique; on 1st whorl initially feeble, then developing into 2, later 3 rows, penultimate whorl with 7–9 rows, base of body whorl with 10–12, becoming weak towards end of rostrum.

Uniform brownish-orange to strong brown.

Protoconch narrowly domed, of slightly more than 1½ whorls, 1st one depressed, suture fairly deep, termination reversed-sigmoid, not forming a rib; smooth except for growth-lines near termination; breadth 1,13 mm, height 0,95–1,00 mm (b/h 1,13–1,19).

Dimensions: 8,8 × 3,7 mm (holotype); paratype length (lip broken) 9,5 mm.

Operculum, radula and soft parts unknown.

Range: Continental shelf of western Transkei, 90–95 m.

Type material: Holotype NM C4485/T3570, off Stony Point (32°35,5'S, 28°42,2'E), 95 m, sponge-rubble. Paratype NM C2542/T3571, off Nthlonyane River, 90–95 m, lithothamnion pebbles. Both dredged *MN*.

Notes: Easily separable from its congeners by its overall orange-brown coloration and fine granulation.

Etymology: *amazimba* = grains of sorghum (*Sorghum caffrorum* (Ret.) Beauv.), Xhosa.

### Subfamily STRICTISPIRINAE McLean, 1971

Diagnosis: Shell clavine; operculum oblanceolate with terminal nucleus. Radula of awl- or dagger-shaped marginal teeth, each with a raised collar towards base. Foregut without poison gland, pressure-bulb or oral tube; odontophore large.

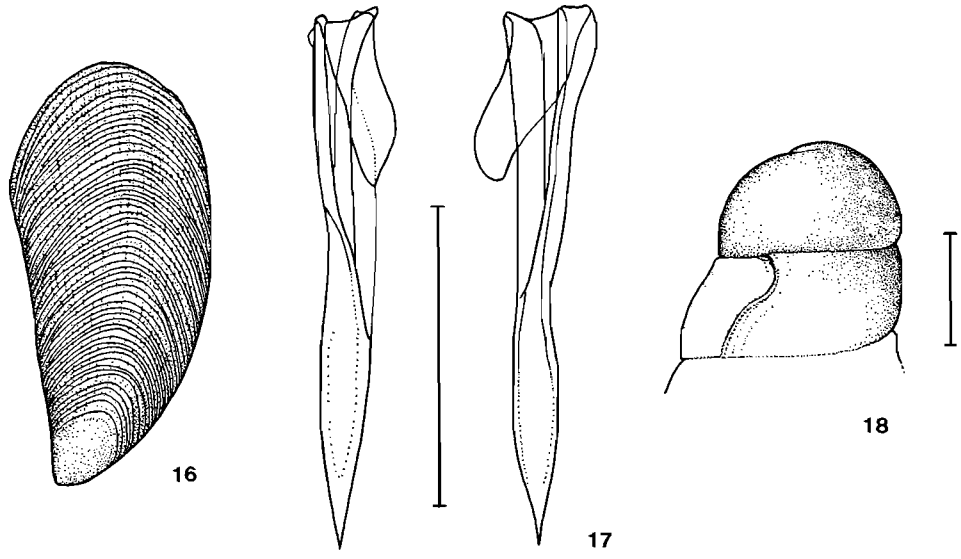
Notes: This subfamily was originally proposed for two genera, *Strictispira* McLean, 1971, and *Cleospira* McLean, 1971, from tropical West America and the Caribbean. Maes (1983) described the anatomy of a western Atlantic species of *Strictispira*.

Despite their clavine appearance, the Indo-Pacific/Australian genera *Paradrillia* Makiyama, 1940, and *Vexitomina* Powell, 1942, have been referred previously to the subfamily Turriculinae [= Cochlespirinae] because they lack a well-developed parietal callus pad and stromboid notch. yet these very features vary within a number of clavine taxa and are by themselves of scant value at the subfamily level. (It might be added that a stromboid notch proves to be present in *Paradrillia melvilli* Powell, 1969). Examination of the radula of *P. melvilli* shows *Paradrillia* (with which *Vexitomina* may be synonymised) to be strictispirine. The subfamily has not been reported previously from the Indo-West Pacific region.

## *Paradrillia* Makiyama, 1940

*Paradrillia* Makiyama, 1940 (as subgenus of *Clavatula*): 133, 134. Type species (o.d.) *Drillia dainichiensis* Yokoyama, 1923.
*Vexitomina* Powell, 1942: 77 (**syn. n.**). Type species (o.d.) *Drillia metcalfei* Angas, 1867.

Diagnosis: Shell moderately small to medium-sized (8–30 mm), claviform, with high, acute spire and short, rather broad, distinctly notched siphonal canal; labrum thin, sometimes lirate inside, anal sinus moderately deep, openly U-shaped, situated on shoulder slope, stromboid notch shallow or absent; parietal callus not forming a distinct pad or nodule posteriorly; subsutural cord fairly strong, more or less nodular, shoulder sulcus well-developed, narrow; sculpture of long, sometimes somewhat lamellate axial ribs, crossed by strong spiral lirae, shoulder with a row of conspicuous nodules; no prelabral varix; colour drab. Protoconch somewhat conical of 1½–3 whorls, last 1–2 whorls medially carinate, usually with arcuate axial riblets preceding termination, or even extending over entire last whorl. Operculum oblanceolate, normally with terminal nucleus. Radula of awl-shaped marginal teeth, trough-shaped in transverse-section, with a collar near base.




Figs 16–18. Operculum, radula and protoconch of some Strictispirinae. **16**, Operculum of *Paradrillia melvilli* Powell, 1969; **17**, Radula teeth of *P. melvilli*, scale-line = 0,05 mm; **18**, Protoconch of *Inkinga platystoma* (Smith, 1877), scale-line = 0,5 mm.

Notes: Whether *Vexitomina* can be maintained even as a subgenus of *Paradrillia* seems very doubtful. The sole difference cited by Powell (1966, 1969), other than the occasional presence of internal lirae in *Paradrillia*, is the position of the nucleus of the operculum, supposedly medio-lateral in *Paradrillia*, terminal in *Vexitomina*. Firstly, the operculum in the type species of *Paradrillia* is unknown, so that such a division relies on an unwarranted supposition. Secondly, Powell's figure (1969: pl 241, fig. 2) of the only operculum of *Paradrillia* known to him appears to show a

teratological example. Certainly, the operculum in two specimens of *P. melvilli* dredged by me has a terminal nucleus.

The protoconch of the type species of *Paradrillia, P. dainichiensis* (Yokoyama, 1923), was figured by Shuto (1961: text-fig. 9.1); this appears to show a weakly carinate last whorl, similar to that of the type species of *Vexitomina* (as figured by Powell 1969: pl. 242, fig. 3). However, a number of protoconch types are represented among the species referred by Powell (1969) to *Paradrillia* and *Vexitomina*, and the complex is probably polyphyletic. Some species at least may prove referable to the genus *Inkinga*, described below.

Shuto (1983) proposed subgenus *Coronacomitas* for *Paradrillia gemmata* Shuto, 1983, which somewhat resembles *Pleurotoma multiseriata* Smith, 1877; the latter was dealt with (Kilburn 1983: 583) under the genus *Epidirona* Iredale, 1931 (subfamily Turrinae), following Powell (1966). Re-examination of *multiseriata* leads me to suspect that the species may also prove to be a *Paradrillia*. Certainly the carinate protoconch is a feature of *Paradrillia*, not of *Epidirona*, and the sculpture is closer to members of the former genus. The position of the anal sinus, however, presents a problem. In typical examples of *multiseriata* the anal sinus lies on the shoulder (a characteristic of the subfamily Turrinae), whereas in *gemmata*, as in the local shells referred to *multiseriata*, it is situated on the shoulder slope. Whether a single variable species (cf. Bouchet & Warén 1980: fig. 60, for somewhat similar variation in sinus position) or several perhaps unrelated taxa are involved, is a question that must await larger and better series. For the present, *Pleurotoma multiseriata* is retained in *Epidirona*, although confirmation of the identity of southern African material is required.

### *Paradrillia melvilli* Powell, 1969

Figs 16, 17, 170–171

*Paradrillia melvilli* Powell, 1969: 314, pl. 242, fig. 2 (protoconch), pl. 245, figs 1, 2. Type locality: Persian Gulf.

*Drillia pyramidula* (*non* Reeve, 1845); Melvill, 1917: 157, pl. 10, fig. 2.

Diagnosis: Shell with an acute apex and relatively narrow aperture, b/l 0,34–0,37, a/l 0,28–0,33, base oblique, distinctly notched; shoulder at about midwhorl, subsutural cord distinct, weakly nodular, shoulder sulcus shallow but distinct, no parietal nodule, but labrum somewhat thickened in posterior angle of aperture; anal sinus relatively narrow, somewhat parallel-sided; shoulder with axially oblong nodules (15–19 on penultimate whorl), situated on thin axial ribs, which are suture-to-suture and reach rostrum; ribs form small gemmules where they intersect moderately strong, well-spaced spiral lirae, 2–3 lirae below shoulder on penultimate whorl, about 3 thin threads in shoulder sulcus; white or pale brown. Protoconch conical, of about 3 whorls, last two with peripheral keel, most of final whorl also with arcuate plicules above keel, breadth 0,73–0,80 mm. Attains about 10 mm.

Range: Persian Gulf and Pakistan to Transkei.

Regional locality data: ZULULAND (all NM: A. Connell): off Durnford Point, 112 m (D4524), do, 115 m (D4513), do, 120 m (D4497). TRANSKEI

(all NM: *MN*): off Mzimhlava River, 50 m, thick mud and clay (C9944); off Mbotyi, 45 m, mud (C9936); do, 45–50 m, mixed mud, sand, some rocks (C7815); off Nqabara Point, 70–75 m, sandstone, mud (C4712); do, 48–50 m, black mud (C5029).

Notes: This species is represented by a number of samples, mostly damaged, and mainly dredged on mud in 45–75 m. Local specimens agree with Powell's description and with an NM topotype, save possibly in having a slightly larger protoconch (breadth 0,73–0,80 mm, instead of 0,63 mm). The only previously recorded member of the genus from the south-western Indian Ocean is *P. alluaudi* (Dautzenberg, 1932) from Madagascar, which lacks peripheral nodules and has a relatively massive subsutural cord.

Operculum (Fig. 16) oblanceolate, slightly curved, with terminal nucleus, growth-lines coarse, crossed by very fine radial striae; translucent yellowish. Radula (Fig. 17) of about 20 rows of awl-shaped marginal teeth, proximal end with a curved 'skirt' (tongue-shaped in side-view) which extends for about a third of the length of each tooth. Tentacles resembling those of *Inquisitor isabella* (Fig. 33).

## **Inkinga** gen. n.

Type species: *Pleurotoma (Clionella) platystoma* Smith, 1877.

Diagnosis: Shell moderately small (10–13 mm), claviform, with high, blunt spire and short, rather broad, shallowly to distinctly notched siphonal canal; base with a moderate to weak fasciole; labrum thin, anal sinus moderately deep, openly U-shaped, situated on shoulder slope, directed slightly adapically, stromboid notch very slight; parietal callus forming a small to moderately large nodule in posterior angle of aperture; subsutural cord feeble or absent, shoulder without a distinct sulcus; sculpture predominantly spiral, at least on later whorls, with pliculate growth-lines, shoulder typically nodular; no prelabral varix; colour pale or drab. Protoconch large, subcylindrical, of about $1\frac{1}{2}$–2 whorls, smooth, except for growth-lines preceding termination. Operculum and radula unknown.

Notes: *Inkinga* somewhat resembles *Paradrillia* Makiyama, 1940, but the subsutural cord is not (or barely) developed, the axial ribs are more or less replaced on later whorls by pliculate growth-lines, and the protoconch (Fig. 18) is large and blunt, without a peripheral keel. It is likely that some of the Australian species previously referred to *Paradrillia* or *Vexitomina* will prove to be better located in *Inkinga*. The type species was previously (Kilburn 1977) referred to *Paracuneus* Laseron, 1954, on account of the greatly reduced sculpture. However, *Paracuneus* is evidently closer to *Drillia* (q.v.) in the Drilliinae, having a large parietal nodule that constricts the anal sinus and a base that is somewhat produced, not abbreviated as in *I. platystoma*. Whether the second species here referred, *cockae* Kilburn, 1977, is truly congeneric, may only be known when radulae are available.

Etymology: *Inkinga* = a problem, Zulu, feminine.

### Key to species of *Inkinga*

Shoulder nodular, spiral lirae broad and flattened (b/l 0,38–0,40) ..... **platystoma**
Shoulder not nodular; spiral lirae fine; shell narrower (b/l 0,33–0,35) ..... **cockae**

## *Inkinga platystoma* (E. A Smith, 1877) **comb. n.**

Figs 18, 172–174

*Pleurotoma (Clionella) platystoma* Smith, 1877: 501. Type locality: 'Cape of Good Hope' [= Port Elizabeth, here restricted].
*Pleurotoma platystoma*; Sowerby, 1892: 5, pl. 4, fig. 82.
*Drillia platystoma*; Smith, 1903: 363; Turton, 1932: 23; Barnard, 1958: 125 (partim).
*Clionella? platystoma*; Bartsch, 1915: 18.
*Paracuneus platystoma*; Kilburn, 1977: 199.
*Pleurotoma wilkiae* Sowerby, 1889: 7, pl. 1, fig. 21; *idem*, 1892: 4, pl. 1, fig. 4. Type locality: Port Elizabeth.
*Drillia platystoma wilkiae*; Turton, 1932: 23.
*Drillia prolongata* Turton, 1932: 23, pl. 5, no 178 [*syn. n*]. Type locality: Port Alfred.
*Drillia ordinaria* Turton, 1932: 23, pl. 5, no 179 [*syn. n*]. Type locality: Port Alfred.
*'Cf. Pleurotoma? paula'* (*non* Thiele, 1925); Barnard, 1958: 126, fig. 12a.
Not: *Drillia platystoma*; Barnard, 1969: 605 [= *Drillia spirostachys* sp. n.].

Diagnosis: Shell with blunt, somewhat papilliform apex, aperture relatively wide, base squarely truncate, shallowly notched, b/l 0,38–0,40, a/l 0,33–0,38; shoulder at about midwhorl, subsutural cord feeble; a small parietal nodule present; anal sinus openly U-shaped; shoulder with small tubercles (13–16 on penultimate whorl), rest of whorl with rather broad, close-set flattened spiral cords, 14–18 on penultimate whorl, crossed by pliculate growth-lines; white or flesh-colour to light orange-brown. Protoconch diameter 0,95–1,20 mm. Attains about 13 mm.

Description: Shell claviform (b/l 0,38–0,40, a/l 0,33–0,38), with very short, squarely truncate base and somewhat blunt, narrowly orthoconic spire; teleoconch whorls about 5, suture shallow; each whorl with a weak to moderate shoulder at about midwhorl, shoulder slope shallowly concave, with only a slight subsutural ridge; left side of base of body whorl concave to convex, with a weak to moderate fasciole, sometimes with a slight false umbilicus. Aperture oblong, greatest width at about posterior third, siphonal canal short, very wide, shallowly notched; columella slightly convex, parietal region concave, callus moderately thick, edge not free, forming a small pad just below suture, but not constricting anal sinus; labrum in side-view moderately convex with very slight stromboid notch and deep, U-shaped anal sinus; interior of aperture sometimes with spiral lirae.

Sculptured by close, flattened, rather broad spiral lirae, early whorls with weak axial riblets, reduced to small shoulder nodules on later whorls; growth-lines coarse, sometimes pliculate where they cross spirals; no varices. Spiral lirae: 8–9 subequal lirae on 1st whorl, 14–16 on penultimate whorl, of which those (numbering 5–7) below shoulder are flattened and close, whereas those above shoulder are thinner and well separated; base with 14–17 fairly flat lirae, those on rostrum finer and rounder. Axial riblets arcuate and suture-to-suture on 1st whorl, by 2nd/3rd whorl replaced by shoulder nodules, of which there are 13–16 on penultimate whorl.

Colour white or pale yellowish-pink to moderate orange, growth-lines somewhat paler where they cross spiral ridges.

Protoconch subcylindrical, somewhat papilliform, of nearly two moderately rounded whorls, smooth except for growth-lines near termination, which is reversed-sigmoid; breadth 0,95–1,20 mm, height 1,00–1,25 mm (b/h 0,95–1,05).

Dimensions: 12,9 × 5,1 mm, 9,7 × 3,7 mm.

Range: Eastern Cape to eastern Transkei, littoral to 90 m.

Locality data (all NM, unless otherwise stated): EASTERN CAPE: Jeffreys Bay, worn (A2827: Mrs C. M. Connolly); Port Elizabeth, littoral (B6818: J. Crawford; 5929: R. K.); off Nanquas Peak, 49 fath. (SAM A8591: *PF*); Port Alfred (B4397: H. Becker; D2207: J. Hutt; B6820: Albany Mus.; 5930: R. K.); off East London, 90 m, coarse sand, sponges (B7994: *MN*). TRANSKEI: between Bulungula and Nkanye Rivers, littoral (B3403: ex. East London Mus.); off Ubombo, 80 m, mixed sand and mud, shell debris (C7594: *MN*); off Port Grosvenor, 80 m, calcareous nodules, lithothamnion sheets (C7307: *MN*); do, 82 m, worn calcareous nodules (C7292: *MN*).

Type material: Four syntypes of *P. platystoma* in BM(NH), holotypes of *P. wilkiae, D. prolongata* and *D. ordinaria* in OUM.

Notes: This uncommon species is known mainly from beach-worn shells, and has not yet been found alive.

Barnard (1958, 1969) confused with *I. platystoma* not only the rather dissimilar *Drillia spirostachys* sp.n., but *D. distincta* Thiele, 1925 [= *D. lignaria* (Sowerby, 1903], *'Surcula' macilenta* Melvill, 1923 [=*Agladrillia macella* (Melvill, 1923)], and *Acinodrillia paula* (Thiele, 1925). The specimens recorded by him as 'Cf. *Pleurotoma paula*' are chalky but recognisable as *platystoma*.

*Inkinga cockae* (Kilburn, 1977) **comb. n.**

Figs 175–176

*Paracuneus cockae* Kilburn, 1977: 198, fig. 30. Type locality: Shelley Beach, just south of Port Shepstone, Natal.

Diagnosis: Shell similar to *I. platystoma,* but narrower (b/l 0,33–0,35), with higher spire (a/l 0,24–0,30), less truncated base, and non-shouldered whorls; no axial ribs or shoulder nodules, spiral threads fine and uniform (occasionally feeble), 25–30 on penultimate whorl, about 34 on base. Protoconch as in *platystoma,* but consisting of slightly over 1½ whorls, breadth 0,95–1,00 mm, height 0,80–0,83 mm (b/h 1,19–1,20). White to light orange-brown. Attains 11,6 mm.

Range: False Bay to Natal south coast.

Additional locality data (see also Kilburn 1977): off False Bay area, *ex pisce,* worn (NM A4020: R. Le Maitre); off East London, 70 m, sand with mud lumps (NM B7921: *MN.*); off Stony Point, Transkei, 70 m, sand (NM C4307: *MN*); Mzamba, Transkei, beachdrift (NM B4694: R. K.); off Port Edward, Natal, 100 m, sponge-rubble (NM B5900: *MN*).

Notes: Fresh examples of this species have now been dredged; these show a faint stromboid notch, not discernible in the beach-derived types.

## Subfamily CRASSISPIRINAE Morrison, 1966

Diagnosis: Shell claviform; operculum oblanceolate, with more or less terminal nucleus. Radula formula 1-0-0-0-1 (rarely 1-1-0-1-1 or 1-0-R-0-1), rachidians or laterals (when present) diaphanous, latter claw-shaped or trigonal; marginal plates somewhat scalpel-shaped, with accessory limb. Poison gland, pressure bulb and oral tube present, odontophore reduced in size.

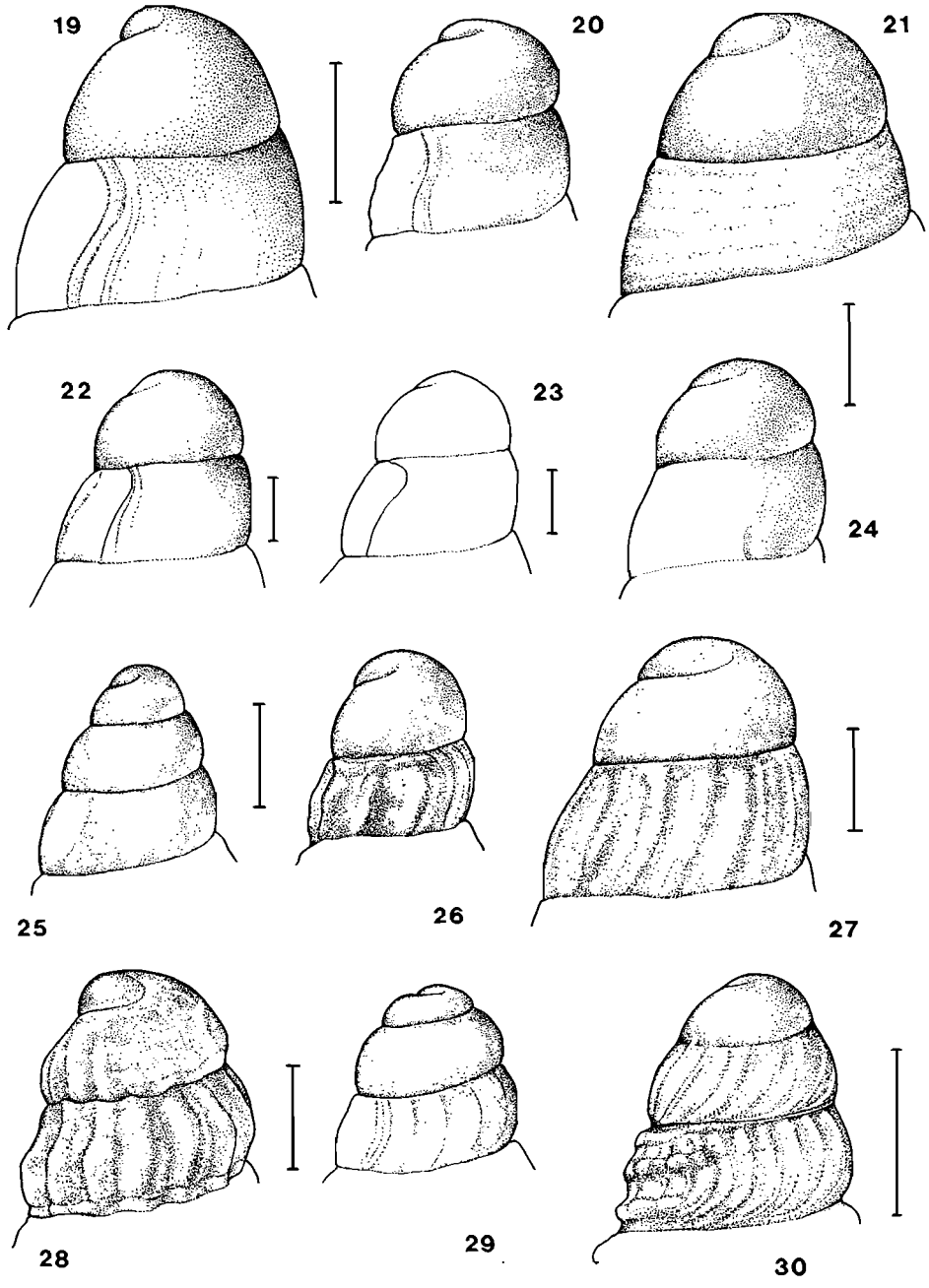
Key to genera of Crassispirinae in southern Africa and Mozambique

1 Protoconch with strong axial ribs ..... 2
— Protoconch smooth or with (at most) a few terminal riblets ..... 4
2 Base strongly contracted, apex large and blunt ..... **Pseudexomilus**
— Base not contracted, apex not large and blunt ..... 3
3 Sculpture predominantly spiral; outer lip not flattened, spirally lirate inside; rachidian plate present ..... **Turridrupa**
Sculpture predominantly axial; outer lip usually flattened, not lirate inside; vestigial lateral plates present ..... **Crassiclava** (part)
4 Surface microscopically shagreened, anal sinus an adapically directed slot; minute ..... **Ceritoturris**
— Surface not microshagreened ..... 5
5 Surface with a chalky, spirally striate intritacalx ..... **Calcatodrillia**
— Surface without such an intritacalx ..... 6
6 Anal sinus very broad and shallow; shell mangeliine; marginal radula plates trowel-shaped ..... **Haedropleura**
— Shell and radula not as above ..... 7
7 No parietal callus; sculpture of fine spiral lirae, and weak axial ribs on early whorls only ..... **Mauidrillia**
— Parietal callus present, axial ribs distinct throughout ..... 8
8 Lip preceded by a distinct varix ..... 9
— Lip not preceded by a distinct varix ..... 11
9 Siphonal rostrum relatively long and narrow, spire high and acuminate .... 10
— Siphonal canal short and broad, shell more squat ..... 11
10 Radula plates with short shaft and single cutting edge; shell with terminal parietal pad ..... **Inquisitor**
— Radula plates with long shaft and double cutting edges; parietal pad forming a rounded nodule shortly *below* termination of lip ..... **Funa**
11 Subsutural cord present; sculpture coarse ..... **Buchema**
— Subsutural cord absent, sculpture weak ..... **Naudedrillia** (part)
12 Anal sinus constricted at opening, siphonal canal deeply notched, apex usually decollated in adult ..... **Nquma**
— Anal sinus not constricted at opening, siphonal canal not deeply notched, apex not naturally decollated ..... 13
13 Shell biconic-claviform with rather straight-sided spire; usually with conspicuously pale ribs on a brown ground ..... **Psittacodrillia**
— Shell not as above ..... 14
14 Subsutural cord present; radula with lateral plates ..... **Crassiclava** (part)
— Subsutural cord absent; radula without lateral plates ..... **Naudedrillia** (part)

## *Turridrupa* Hedley, 1922

*Turridrupa* Hedley, 1922: 226. Type species (o.d.) *Pleurotoma acutigemmata* E. A. Smith, 1877.

Diagnosis: Shell small to medium-sized (12–33 mm), claviform with moderate to very short siphonal canal; parietal pad sometimes weak or absent, not constricting anal sinus; anal sinus only moderately deep, U-shaped, with its apex at termination




Figs 19–30. Protoconchs of some Crassispirinae. **19**, *Naudedrillia nealyoungi* sp. n.; **20**, *N. praetermissa* (Smith, 1904); **21**, *Psittacodrillia diversa* (Smith, 1882); **22**, *Calcatodrillia hololeukos* sp. n.; **23**, *C chamaeleon* sp. n.; **24**, *Nquma rousi* (Sowerby, 1886); **25**, *Funa laterculoides* (Barnard, 1958); **26**, *Inquisitor isabella* sp. n.; **27**, *Crassiclava layardi* (Sowerby, 1897); **28**, *Pseudexomilus fenestratus* sp. n.; **29**, *Haedropleura summa* sp. n.; **30**, *Turridrupa cincta* (Lamarck, 1822). Scale-line = 0,5 mm.

of 1–2 spiral lirae on shoulder or lower shoulder-slope; interior of aperture with spiral lirae; sculpture mainly spiral, subsutural cord and sulcus not always indicated. Protoconch conical to pupiform, of 2,5–4 whorls, last half to two whorls with axial riblets. Operculum oblanceolate with terminal nucleus. Radula with a large, diaphanous rachidian, bearing an uncinate median cusp, and crassispirine marginals.

Notes: The systematic position of *Turridrupa* has been a subject for debate. On shell-characters, Powell (1966: 54, 1967: 413) referred it to the subfamily Turrinae. On similar grounds, Kilburn (1983: 550) transferred the genus to the Clavinae (*sensu* Powell). Some confusion has resulted from Powell's figure (1967: pl. 300) of the radula of *Turridrupa jubata* (Hinds, 1843), in which the marginals were evidently misinterpreted from an unstained preparation. Having now examined the radulae of two further species (Figs 39–40) I conclude *Turridrupa* to be a primitive crassispirine clade, with typical marginal radula plates, but retaining a rachidian. SEM photographs of the radula of the type species, *T. acutigemmata,* kindly sent to me by the late Mrs Virginia O. Maes, agree. She informed me, however, that *Pleurotoma cerithina* Anton, 1838, which has generally been referred to *Turridrupa,* lacks rachidians (see under *Inquisitor*).

Key to *Turridrupa* species in southern Africa and Mozambique

1 Subsutural cord strong, shoulder cord relatively weak, never crenulated, intervals between cords with well-developed spiral striae, shape somewhat pupiform, colour uniform yellowish-brown ..... **cincta**

– Subsutural cord weaker than shoulder cord, which is often crenulate, intermediary spirals weak to very weak ..... 2

2 Colour uniform yellowish-brown, siphonal canal slightly produced **acutigemmata**

— Colour dark brown with paler cords, siphonal canal very short ..... **bijubata**

*Turridrupa cincta* (Lamarck, 1822)
Figs 4, 30, 39

*Pleurotoma cincta* Lamarck, 1822: 92; Kiener, 1840: 60, pl. 19, fig. 5 (possible type). Type locality: Mauritius.

*Turridrupa cincta*; Powell, 1967: 421 (references), pl. 301, fig. 5, pl. 3077; Cernohorsky, 1978a: 151, pl. 54, Fig. 1.

Range: Japan and Polynesia to northern Mozambique.

Regional locality data: NORTHERN MOZAMBIQUE: Conducia Bay, fine sand inside reef, some surf, 3 ft above LST (NM H2387: K. Grosch); off Cabaceira Pequena, Mozambique Bay, soft sand above coral and *Thalassodendron* (NM H2388: K. Grosch).

Notes: Mozambique examples agree well with a topotypic series (NM G3754). Material from Reunion Island sent by J. Drivas provides the following data: Protoconch (Fig. 30) cyrtoconic, of about 2,5 convex whorls, initially smooth, the last 1,5 whorls with suture-to-suture axial ribs; breadth 0,70 mm, height 0,68 mm. Operculum (Fig. 4) very thick. Tentacles as in *Inquisitor isabella.* Radula (Fig. 39) with massive but diaphanous rachidian bearing an acicular mesocone, marginals with very large accessory limb; about 48 rows of teeth.

### *Turridrupa bijubata* (Reeve, 1843)

*Pleurotoma bijubata* Reeve, 1843: pl. 10, sp. 87; Smith, 1903: 362. Type locality: Burias Is., Philippines.
*Turridrupa bijubata*; Powell, 1967: 418 (references), pl. 303, figs 1, 2, pl. 304; Cernohorsky, 1978a: 151, pl. 54, fig. 2; Kay, 1979: 340, fig. 111 H (veliconcha), 113 I.

Range: Japan and Hawaii to Natal.

Regional locality data: NATAL: Durban (NM 603: H. C. Burnup, recorded Smith 1903); Scottburgh (NM 6679: W. Falcon).

Notes: The only available local specimens of this well-known Indo-Pacific species are worn. The radula of a Reunion Island example sent by J. Drivas is illustrated in Fig. 40; it resembles that of *T. cincta,* and has about 48 rows of plates.

### *Turridrupa acutigemmata* (E. A. Smith, 1877)

Figs 40, 279.

*Pleurotoma acutigemmata* E. A. Smith, 1877: 489. Type locality unknown.
*Turridrupa acutigemmata*; Powell, 1967: 415 (references), pl. 301, fig. 1 (holotype); Shuto, 1975: 163, pl. 6, figs 10–12 (holotype).

Range: Japan and Fiji to Natal.

Regional locality data: SOUTHERN MOZAMBIQUE: Bazaruto Island, 20–25 ft, sandbanks (NM G4991: Mrs E. Roscoe); between Maputo and Zavora, *ex pisce* (NM J486: C. Fernandes). ZULULAND: S.E. of Kosi Bay, 50 m, medium sand, rubble, algae (NM D8923, D6222: *MN*); off Kosi Bay, 75 m, coral rubble, sandstone, marine growths (NM D9016: *MN*); off Dog Point, 50 m, sandstone conglomerate, marine growths (NM D7077: *MN*); off Rocktail Bay, 100 m, sandstone rubble (NM D7631: *MN*); off Gobey's Point, 44–66 m, sand, shell rubble (NM D7161: *MN*); off Jesser Point, 65–70 m, fine sand (NM D8578, D8825: *MN*); Ledsman Shoal, 100 m (NM B4011: A. Connell); off Richards Bay, *ex pisce* (NM B1914: L. Whatmore). NATAL: off Isipingo, 55 m (NM B3042: A. Connell); S. E. of Umzimbazi River, 65 m, fine sand (NM D3742: *MN*); between Umgababa and Umzimbazi Rivers, 70 m, fine sand (NM D3558: *MN*). All specimens dead.

Notes: The holotype (BM(NH) 1963856) has strong, compressed nodules on the shoulder cord, which Powell (*loc. cit.*) regards as diagnostic. However, Smith (1904b: 457) and Schepman (1913: 400) noted that in some examples this keel was nearly smooth. This applies to all regional specimens examined, in which the shoulder keel bears slight crenulations at most. I suspect that *Turridrupa deceptrix* Hedley (1922: pl. 42, fig. 14) will prove to be based on such non-gemmulate individuals. Similar variation in this character is reported for *T. bijubata.*

Protoconch (Fig. 279): cyrtoconic, of about 4 whorls, the first tiny, the rest convex, last 1,5 whorls with strongly arcuate, somewhat opisthocline axial ribs, which terminate slightly above lower suture; suture bordered below by a low cord, rendered somewhat nodular by terminations of ribs; under SEM strongly prosocline striae are visible immediaely above suture, and on the crests of ribs as high as peripheral region; breadth 0,93–1,00 mm, height 0,93–1,03 mm (b/h 0,90–1,00).*

* While in press I was informed by Mr J. Drivas that Pacific specimens agreeing with *Turridrupa acutigemmata* differ in possessing a protoconch of 1,5 smooth whorls. As the protoconch is missing in the holotype, careful comparison will be necessary to demonstrate which of the two species concerned is the true *acutigemmata.*

## *Pseudexomilus* Powell, 1944

*Pseudexomilus* Powell, 1944: 61. Type species (o.d.) *Pseudexomilus caelatus* Powell, 1944.

Diagnosis: Shell moderately small (8–12 mm), claviform with high spire, blunt apex and short, contracted base, aperture small, somewhat quadrate, except for the short, spout-like, unnotched siphonal canal, no fasciole; labrum thin, with very shallow to deep, openly U-shaped anal sinus, no stromboid notch or parietal callus pad; whorls without subsutural cord or sulcus, shoulder slope sometimes gently concave; sculptured by spiral cords and weak peripheral axial ribs. Protoconch large, of about 2½ whorls, tip smooth or with two low spiral cords, rest with strong axial ribs. Operculum, radula and soft parts unknown.

Notes: *Pseudexomilus* was based on a species from the Pliocene of South Australia, characterised by its somewhat terebriform shape and large, axially ribbed protoconch. Subsequently, Powell (1966:137) referred here also the Recent South Australian *Drillia costicapitata* Verco, 1909). He regarded the genus as a member of the subfamily Daphnellinae [=Raphitominae], but the growth-lines visible in the type figures of both *P. caelatus* (Powell, 1944: pl. 6, Fig. 12) and *P. costicapitata* (Verco, 1909: pl. 27, Fig. 1) appear to show an anal sinus that is possibly mangeliine but more probably 'clavine'. In the new South African species, here described, the anal sinus forms a deep embayment with its rounded apex on the mid shoulder-slope, and in the fourth known member of the genus, *P. bicarinata* Shuto, 1983, from Queensland, the sinus is similar but very shallow. Despite the absence of a parietal pad I suspect *Pseudexomilus* to be a clavine genus. The axially ribbed protoconch is probably indicative of subfamily Crassispirinae, although radula evidence is required.

### **Pseudexomilus fenestratus** sp. n.

Figs 28, 177–178

Diagnosis: Shell with b/l 0,38–0,41, a/l 0,27–0,33, anal sinus relatively deep and broad; whorls angular, with 2–3 strong spiral cords occupying basal half of each whorl, crossing short, broadly rounded axial ribs (13–15 per whorl), to form quadrate interstitial pits; shoulder slope smooth or with 4–6 feeble spiral threads; base of body whorl with somewhat nodular peripheral cord followed anteriorly by 14–17 very low spiral lirae; cream or pale yellowish-brown, flecked and blotched with brown, protoconch white with a brownish blotch next to tip; protoconch with first whorl bearing two weak spiral keels and faint axial ribs, 2nd whorl with about 14 strong axial ribs, protoconch diameter 1,15–1,25 mm. Attains 13,8 mm.

Description: Shell narrowly claviform (b/l 0,38–0,41, a/l 0,27–0,33) with high, orthoconic spire and blunt apex, base short, strongly contracted; teleoconch whorls about 6¼, suture shallow and slightly undulating; whorls angular, with periphery just below median, subsutural region broadly and somewhat shallowly concave, without a subsutural cord, left side of base of body whorl strongly concave, without a fasciole. Aperture ovately quadrate, with a medially squared labrum and short, open, strongly oblique siphonal canal, whose termination is not dorsally indented; base of columella convex, parietal region concave, labial callus very thin; labrum strongly convex in side-view, with a moderately deep, openly and asymmetrically U-shaped anal sinus, directed slightly adapically, but no stromboid notch.

Sculptured by strong spiral cords which occupy the basal half of each whorl, crossing broader but lower axial ribs, and forming quadrate interstitial pits, subsutural region with at most very weak spiral lirae; growth-lines coarse, somewhat pliculate. Spiral cords 2–3 per whorl, 3rd cord sometimes just showing above suture, at least on early whorls, and bordered anteriorly on body whorl by a 4th weaker and somewhat nodular cord; rest of base with about 14–17 very low spiral lirae, those on rostrum stronger but narrower; shoulder slope smooth or with 4–6 barely elevated but fairly broad spiral lirae. Axial ribs 13–15 per whorl, rapidly evanescing on base of shoulder slope and on body whorl at level of last suture, well-rounded, slightly opisthocline, somewhat wider than intervals.

Colour [near] pale orange-yellow to light yellowish-brown, flecked with brown, base of body whorl and sometimes intervals between ribs suffused with yellowish-brown, with an occasional very diffuse blotch of that colour on shoulder slope; protoconch white, with a comma-shaped brownish blotch next to tip.

Protoconch (Fig. 28) somewhat domed, of about 2 convex whorls (termination ill-defined), with rather deep suture; 1st whorl somewhat flattened but initially projecting sidewards, and bearing two weak spiral keels and traces of incipient axial ribs, giving the first whorl a somewhat malleate appearance; these ribs increase in strength and on 2nd whorl are strong, orthocline, arcuate and suture-to-suture and about 14 in number; breadth 1,15–1,25 mm, height 1,25 mm (b/h 0,92–1,00).

Dimensions: 13,5 × 5,1 mm (holotype); 13,8 × 5,4 mm (paratype).

Operculum, radula and soft parts unknown.

Range: Continental shelf of Natal and Zululand, 47–140 m.

Type material: Holotype NM D4451/T3574, off Park Rynie, Natal (30°23,2'S, 30°50,6'E), 140 m, some sand, sponge rubble, dredged *MN*. Paratypes all NM colln., ZULULAND: Paratype 1, B4016/T3575, off Ledsman Shoal, 100 m, dredged A. Connell. Paratype 2, D6737/T3925, off Jesser Point, 68 m, sponge, coral rubble, juvenile, *MN*. Paratype 3, D8470/T3926, off Jesser Point, 70 m, medium sand, *MN*. Paratype 4, D6831/T3927, off Boteler Point, 50 m, live corals, sponges, *MN*. Paratype 5, D8922/T3928, S. E. of Kosi Bay, 50 m, medium sand, rubble, *MN;* paratype 6, D6219/T3929, same data, medium sand, algae. Paratypes 7–8, D8033/T3930, S. E. of Kosi Bay, 65 m, sponge, gorgonians, medium sand, *MN*. Paratype 9, D6124/T3931, off Kosi Bay, 47 m, dead coral, sponges, large algae, *MN*. Paratype 10, A5965/T3576, off Kosi Bay, Zululand, 50 m, from CSIR Water Res. bottom-sample, juvenile. All types are dead shells.

Notes: *P. fenestratus* differs widely from its three previously described congeners, notably in its well-developed anal sinus, strong axial ribbing and bicarinate protoconch nucleus.

Etymology: *fenestratus* = windowed, L.

## *Crassiclava* McLean, 1971

*Crassiclava* McLean, 1971: 121 (as subgenus of *Crassispira*). Type species (o.d.). *Pleurotoma turricula* Sowerby, 1834.

Diagnosis: Shell relatively small to moderately large (9–36 mm), narrowly clavine with high spire, aperture elongate and relatively narrow, siphonal canal moderately

deeply notched to unnotched; anal sinus fairly shallow to moderately deep, openly U-shaped, usually directed somewhat abapically, bordered by a more or less strong parietal nodule, stromboid notch weak; lip sometimes preceded by a varicoid rib; subsutural cord absent to moderately strong, whorls more or less shouldered, with axial ribs and fine spiral threads; uniform brown or patterned with brown on a pale ground, with a thin, dark periostracum. Protoconch domed, of 2–2½ whorls, last whorl typically with distinct axial ribs. Radula with duplex marginals and diaphanous, uncinate lateral teeth. Sperm duct opening through a retractile papilla.

Notes: In 1970 I interpreted the flimsy admedian teeth of the South African *layardi* Sowerby, 1897, as vestiges of the basal plate which supports the rachidian in some Turridae. McLean (1971a) regarded them as actual rachidians. However, Maes (1983: fig. 37) illustrated a Caribbean example in which these structures are clearly seen to consist of paired lateral teeth. Although previously treated as a subgenus of *Crassispira, Crassiclava* is here regarded as worthy of full generic status on account of its radula, which is unique within the Turridae. Possibly most of the southern African species (together with the unlocalized *Pleurotoma castanea* Reeve, 1845) should be separated subgenerically from the American ones on account of their unnotched siphonal canal, shallower anal sinus, and lack of either a subterminal varix or subsutural cord. *Crassiclava halistrepta* (Bartsch, 1915), previously treated as a *Clavatula,* possesses a typical subsutural cord, but is aberrant in its large size and smooth protoconch.

Key to species of *Crassiclava* in southern Africa

1 Subsutural cord well developed; adult large (30–36 mm), protoconch smooth ..... **halistrepta**
— Subsutural cord not developed; adult not exceeding 15 mm in length, protoconch with last whorl partially axially ribbed ..... 2
2 Whorls moderately convex, with a weak shoulder (at most), spiral lirae feeble, except on base of body whorl ..... 3
— Whorls strongly convex, with prominent but well-rounded shoulder, spiral lirae distinct throughout, 10–13 on penultimate whorl ..... **omia**
3 With pale yellowish peripheral band; axial ribs 8–10 per whorl ..... **balteata**
— Without a pale peripheral band; axial ribs 11–16 on later whorls ..... **layardi**

*Crassiclava layardi* (Sowerby, 1897), **comb. n.**

Figs 27, 180–182

*Pleurotoma (Drillia) layardi* Sowerby, 1897: 2. pl. 8, fig. 3. Type locality: Pondoland [= Dwesa, Transkei, here restricted].
*Drillia layardi*; Bartsch, 1915: 21; Turton, 1932: 23.
*Crassispira layardi*; Kilburn & Rippey, 1982: 116, 214, pl. 28, fig. 9.
*Pleurotoma castanea (non* Reeve, 1845); Sowerby, 1886: 5.
*Drillia hottentota* (*non* Smith, 1882); (*partim*) Barnard, 1958: 120.
*Clavatula hottentota*; Barnard, 1958: 101.
*Crassispira hottentota*; Kilburn, 1970: 40, figs. 4 (radula), 5 (penis).
*Drillia sowerbyi* Turton, 1932 (*non Pleurotoma sowerbyi* Reeve, 1843): 22, pl. 4, no. 170 [*syn. n.*]. Type locality: Port Alfred.

Diagnosis: Shell narrowly claviform (b/l 0,36–0,41, a/l 0,29–0,36), whorls moderately convex with a feeble shoulder or none, subsutural border slightly

swollen but not forming a cord; axial ribs moderately strong, crests rounded in cross-section with gradually sloping sides, 11–16 on body whorl; spiral lirae feeble, mostly restricted to base of body whorl (where number about 8–12); anal sinus rather shallow, directed somewhat abapically; uniform dark brown to orange-brown, or light brown with darker rib intervals. Protoconch with last half-whorl axially ribbed, diameter 1,15–1,25 mm. Attains 15 mm.

Description: Shell narrowly claviform (b/l 0,36–0,41, a/l 0,29–0,36), with high orthoconic spire and short, truncate base; teleoconch whorls 5, suture shallow, whorls moderately convex, their periphery median, shoulder feeble or absent; shoulder slope slightly concave, with a feeble swelling at suture, but no definite subsutural cord or sulcus; left side of base of body whorl gently concave, without a distinct fasciole. Aperture oblong-ovate, greatest width median, siphonal canal wide, unnotched; labial callus thick, outer edge slightly free on columella, parietal pad strong, constricting anal sinus; columella slightly convex, parietal wall concave; labrum gently convex in side-view, with a slight stromboid notch and moderately shallow, U-shaped anal sinus, directed somewhat abapically.

Sculptured by moderately strong axial ribs, spiral lirae feeble, restricted to base of body whorl, weak striae occasionally present elsewhere, growth-lines coarse, no varices. Axial ribs opisthocline, relatively straight, initially suture-to-suture, but on later whorls evanescing on shoulder concavity, on base often continuing almost to rostrum, not weakening behind lip; subequal in width to intervals, crests rounded with gradually sloping sides; 10–12 ribs on 1st whorl, 11–13 on penultimate, 11–16 on body whorl. Spiral lirae 8–12 on base, occasionally extending as high as parietal level.

Uniform dark brown to brownish-orange, or light brown with intervals between ribs strong brown.

Protoconch (Fig. 27) narrowly domed, of nearly 2 whorls, gently rounded; smooth except for last half-whorl, where there are orthocline, suture-to-suture axial ribs, mostly straight but becoming slightly reversed-sigmoid toward teleoconch junction; breadth 1,15–1,25 mm, height 1,00–1,30 mm (b/h 0,92–1,25).

Dimensions: 11,3 × 4,6 mm (small adult), 15,0 × 5,2 mm (large adult, protoconch missing).

Operculum, radula and penis: see Kilburn (1970).

Range: West coast of Cape Peninsula to western Transkei, littoral.

Regional locality data (all NM): ATLANTIC CAPE: Kommetjie (5958, A2790, A2839: Mrs C. M. Connolly). FALSE BAY: Millers Point (5966: R. K.; A2796: Mrs C. M. Connolly); Simonstown dredgings (A2797: Connolly). AGULHAS AREA: Cape Agulhas (A2794: Connolly). EASTERN CAPE: Jeffreys Bay (B1903, H4396: R. K.); Algoa Bay (6927: H. C. Burnup; A4880, B351: F. Graeve); Port Alfred (B4382: H. Becker; B671: E. K. Jordan; B6813: D. H. Kennelly; A1589: R. K.); East London (A2789, A2798: Mrs C. M. Connolly); Kwelera (A2795: Mrs C. M. Connolly); Bulugha (5957: R. K.); off Gonubie Point, 30 m, marine growths (B8512: *MN*). TRANSKEI: Kei River (C3563: R. K., R. Fregona); Qolora River mouth (C3349: R. K., R. Fregona); Dwesa (C6011: R. K.).

Type material: Three worn syntypes BM(NH) 99.4.14.3682–4 from 'Pondoland'. The occurrence of *C. layardi* in Pondoland (i.e. east of the Umtata River) has not been confirmed, and it is probable that the types were obtained by Layard from Col. J. H. Bowker, who appears to have collected further west, in Tembuland. The type locality is consequently here emended to Dwesa, western Transkei (about 32°18'S, 28°51'E), the easternmost locality from which I have examined specimens.

Holotype of *Drillia sowerbyi* Turton, 1932, in OUM. This name is a junior secondary homonym of *Pleurotoma sowerbyi* Reeve, 1843, curiously a synonym of the type species of *Crassiclava, C. turricula* (Sowerby, 1834) of tropical west America.

Notes: A common species in beach-drift, occasionally living in low-tide rock-pools on the Atlantic coast.

There is some resemblance to *Pleurotoma castanea* Reeve, 1845, under which name it was originally recorded from South Africa (as was the very dissimilar *Drillia lignaria* (Sowerby, 1903)). The holotype of *P. castanea* (Fig. 183), BM(NH) 1875.4.26.23, represents a much larger species, with more distinctly shouldered whorls than *C. layardi*. The type locality was unknown, and the only subsequent record of which I am aware is Weinkauff's citation (1876: 102) of 'Mollukken'; however, the illustration given by him (pl. 22, figs 4, 6) shows a species very different to the true *castanea*.

*Crassiclava omia* (Barnard, 1958), **comb. n.**

Fig. 184

*Drillia omia* Barnard, 1958: 123, fig. 11a; *idem*, 1969: 607. Type locality '?Port Alfred' [= Table Bay, here designated].

Diagnosis [adult apertural characters unknown]: Shell somewhat bucciniform, whorls strongly convex with a strong, well rounded shoulder, subsutural border not swollen nor forming a cord; axial ribs strong, their crests sharply rounded in cross-section with steep sides, 10–12 on body whorl; spiral lirae thin but well-developed throughout, 10–13 on penultimate whorl; orange-brown. Protoconch with last half-whorl strongly axially ribbed, diameter 0,89 mm. Attains 9,8 mm.

Description [based on beach-worn examples]: Shell somewhat bucciniform, with moderately high, orthoconic to weakly cyrtoconic spire and fairly short, evidently truncate base; teleoconch whorls 4+, suture shallow, whorls strongly convex, their periphery median, shoulder strong but well-rounded; shoulder slope gently concave, without a swelling at suture, and no definite subsutural cord or sulcus; left side of base of body whorl strongly concave, without a fasciole [in adult?]. Adult apertural characters unknown.

Sculptured by strong axial ribs, spiral lirae narrow but well-developed, growth-lines slightly pliculate in interstices. Axial ribs somewhat opisthocline, evanescing on shoulder concavity, on base continuing to level of upper columella; narrower than their intervals, crests sharply rounded in cross-section, with steeply sloping sides; 9–10 ribs on 1st whorl, 10–12 on body whorl. Spiral lirae somewhat tabulate, more or less equal in width to their intervals, 10–13 on penultimate whorl, about 13 on base of body whorl.

Uniform light brown to brownish-orange.

Protoconch narrowly domed, of 2 whorls, gently rounded; smooth except for last half-whorl, where there are strong axial ribs; ribs slightly opisthocline, suture-to-suture, close, more or less straight; breadth 0,89 mm [apical whorl damaged].

Dimensions: 9,8 × 4,2 mm.

Range: Table Bay area to Orange River.

Locality data: ATLANTIC CAPE: Sea Point, Cape Town, beach (NM B362: Mrs C. M. Connolly); off Orange River mouth (SAM A29667). Erroneous: Port Alfred (NM B6788: ex Albany Mus.).

Type material: Syntypes SAM A8651, originally eleven shells, now ten (c.f. Giles & Gosliner 1983: 31); the missing shell appears to have been the freshest example, figured by Barnard. The least damaged specimen, measuring 9,8 × 4,2 mm, is here designated as lectotype (Fig. 184). The remaining paralectotype series includes two fragmentary specimens of *Crassiclava layardi* and a single example of the dark Atlantic Cape form (*kitchingi* Sowerby, 1892) of *Anachis kraussii* (Sowerby, 1844); the presence of the last confirms Barnard's subsequent suggestion (1969: 607) that the types originated from the west coast rather than Port Alfred. (The Albany Museum examples labelled 'Port Alfred' probably came from H. Becker's collection, in which occasional shells from the Table Bay area were accidentally mixed with local (Port Alfred) material, the most notable case being the holotype of *Gibbula beckeri* Sowerby, 1901).

Notes: Although the adult apertural characters are still unknown, the close resemblance between the protoconch of *omia* and that of *Crassiclava layardi* indicates the two species to be congeneric.

*Crassiclava halistrepta* (Bartsch, 1915), **comb. n.**

Figs 41, 187

*Clavatula halistrepta*; Kilburn, 1985: 433 (references and synonymy), Figs 8 (protoconch), 47, 48.

Notes: In Part 2 of my Turridae series I dealt with this species under the genus *Clavatula,* although noting that it 'may ultimately prove to be a clavinid'. Subsequently, a living specimen (NM D4301) has been dived in Algoa Bay by Mr Brian Hayes, who found it on the surface of sand under a rock overhang in 10–15 m. The example is clearly referable to *halistrepta,* although larger (length 36,1 mm) and proportionately broader than the beach shells previously known; it also shows an unusual colour-pattern of deep brown axial streaks (mainly restricted to the rib intervals) on a contrasting pale yellow ground, the latter colour forming a band around the periphery, and showing also on the base, the subsutural region being blotched with both colours. Its operculum proves to have a terminal nucleus (not lateral as in *Clavatula*), and its radula is crassispirine, but with vestigial lateral plates. Despite some differences in shell form (notably the totally smooth protoconch), *halistrepta* must now be referred to the genus *Crassiclava.*

The following notes were made: Soft parts pale flesh-colour with scattered groups of black spots, tentacles as figured for *Drillia connelli* (Fig. 12), eyes relatively small. Operculum as in *Naudedrillia praetermissa* (Fig. 3), moderate

yellowish-brown in colour. Radula (Fig. 41) of about 55 rows of teeth, marginals resembling those of *Inquisitor,* accessory limb long and slender, lateral plates bluntly trigonal, but so diaphanous as to be scarcely visible, even with staining.

**Crassiclava balteata** sp. n.

Figs 185–186

Diagnosis: Shell narrowly claviform (b/l 0,35–0,36, a/l 0,37–0,39), whorls convex with a weak shoulder, subsutural border not swollen; axial ribs moderately strong, crests sharply rounded in cross-section with gradually sloping sides, 8–10 per whorl; spiral lirae feeble, mostly restricted to base of body whorl (where number about 22); anal sinus moderately deep, directed somewhat abapically; orange-brown with narrow peripheral band of pale yellowish. Protoconch with last quarter-whorl axially ribbed, diameter 1,15–1,35 mm. Attains about 17 mm.

Description: Shell narrowly claviform (b/l 0,35–0,36, a/l 0,37–0,39), with high orthoconic spire, rather narrow aperture and short, obliquely truncate base; teleoconch whorls 6, suture shallow, whorls convex, their periphery median, shoulder rather weak and sloping; shoulder slope moderately concave, without even a feeble swelling at suture; left side of base of body whorl gently concave, with a moderate to strong fasciole, false umbilicus present but narrow. Aperture narrowly oblong-pyriform, greatest width at about posterior third, tapering gradually to the wide, terminally unnotched siphonal canal; labial callus thick, outer edge slightly free on columella, parietal pad strong to massive, greatly constricting anal sinus; columella almost straight, parietal wall concave; labrum gently convex in side-view, with a very slight stromboid notch and moderately deep, narrowly and asymmetrically U-shaped anal sinus, directed somewhat abapically.

Sculptured by moderately strong axial ribs, spiral lirae feeble, restricted to base of body whorl, weak striae occasionally present elsewhere, growth-lines coarse, no varices but penultimate rib somewhat pronounced. Axial ribs opisthocline, relatively straight, on 1st whorl suture-to-suture, but on later whorls evanescing on shoulder concavity and on base at level of parietal/columella junction, final rib somewhat weak; narrower than intervals, crests sharply rounded with gradually sloping sides; 8–10 ribs per whorl throughout. Spiral lirae approximately 22 on base, extending posteriorly at least as high as parietal level.

Colour light brown, paler on base, slightly darker on shoulder slope, with a continuous pale peripheral band.

Protoconch narrowly domed, of 2 whorls, gently rounded, smooth except for last quarter-whorl, where there are straight, suture-to-suture axial ribs, termination sharply defined; breadth 1,15–1,35 mm, height 1,25–1,40 mm (b/h 0,92–0,96).

Dimensions: 14,5 × 5,1 mm (holotype); smallest paratype 14,3 × 5,1 mm, largest 16,9 mm (lip immature).

Operculum, radula and soft parts unknown.

Range: Agulhas Bank.

Type material: Holotype NM D4484/T3557, off Cape St Blaize area, from gut of *Congiopodus* spp, R. Le Maitre. Paratypes 1–8, NM B1041/T3558, same data.

Notes: Referred to *Crassiclava* on account of the close resemblance in both teleoconch and protoconch characters to those of *C. layardi.* From that species, *C. balteata* differs in details of shape, and in possessing a pale peripheral band, a deeper anal sinus, fewer axial ribs, and more numerous basal lirae.

Etymology: from *balteus,* a belt or girdle, L.

### *Buchema* Corea, 1934

*Buchema* Corea, 1934: 1. Type species: *Carinodrillia (Buchema) tainea* Corea, 1934.

Description: Shell claviform, rather small (7–20 mm), with moderate to high spire and short, somewhat squarely truncate base, with a distinct fasciole, siphonal canal moderately deeply notched; anal sinus fairly deep, U-shaped, somewhat constricted by parietal pad, stromboid notch distinct; lip preceded by a varix; subsutural cord moderate, with distinct shoulder sulcus, rest of whorl sculptured by axial ribs, crossed by strong spiral lirae, sometimes rather nodose at points of crossing; drab or colourless, sometimes zoned with brown. Protoconch narrowly domed, of approximately 2–2½ whorls, smooth, except for weak axial riblets (and sometimes faint spiral striae) on last half whorl. Operculum oblanceolate, with terminal nucleus. Radula typically crassispirine.

Notes: Powell (1966: 78) followed Corea (1934) in ranking *Buchema* as a subgenus of *Carinodrillia* Dall, 1919, from which it differs in its non-carinate protoconch. Recent American workers treat it as a full genus, although I can find no clear statement of the characters distinguishing *Buchema* from *Crassispira.* The single southern African species, *B. dichroma,* is referred here solely on general resemblances in shell characters.

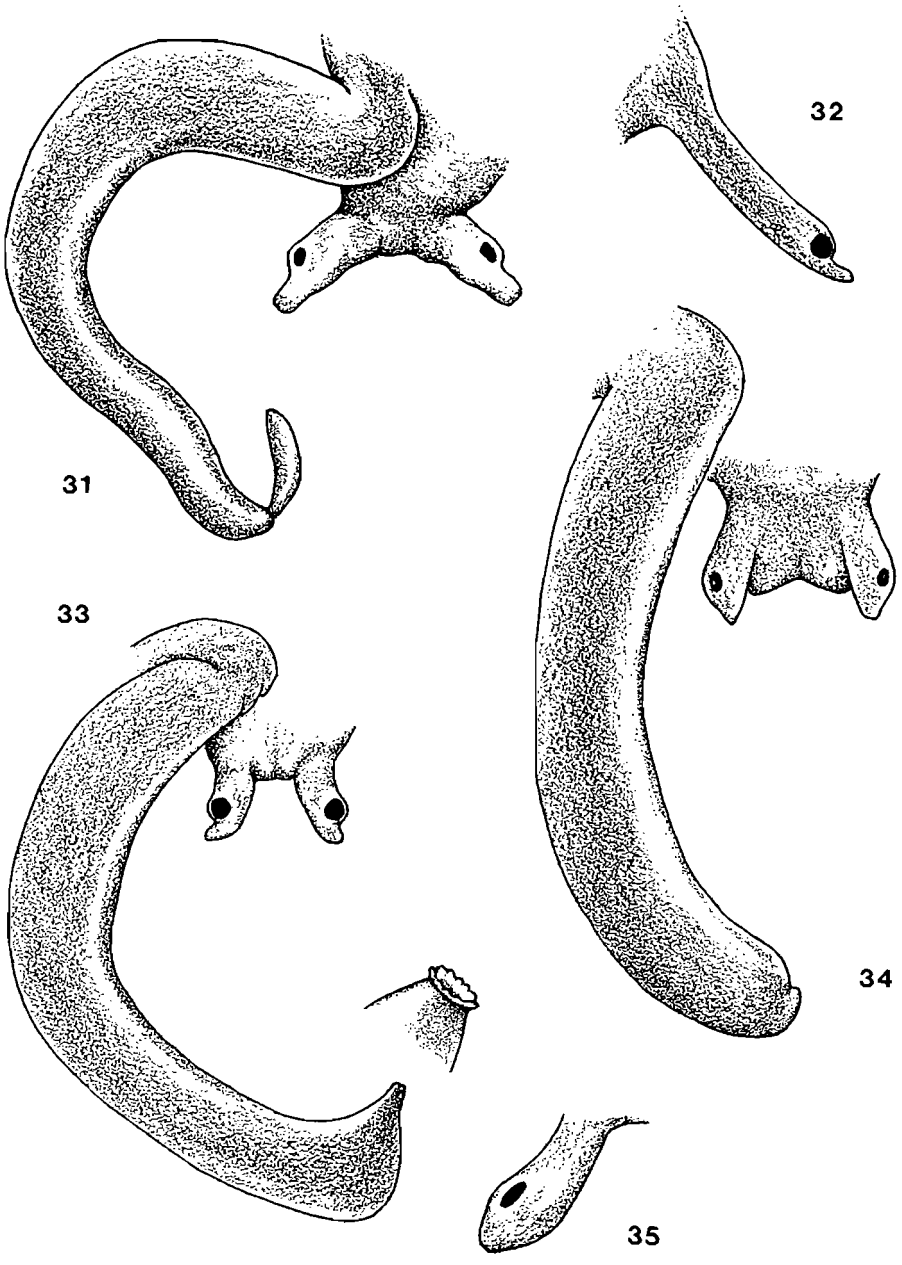
Kaicher (1984) has illustrated shells of seven Caribbean species of *Buchema,* and Maes (1983) has discussed aspects of the anatomy and biology of an eighth. McLean (1971a) figured the radula of the sole West American member of the genus.

### **Buchema dichroma** sp. n.

Figs 188–189

Diagnosis: Shell rather squat (b/l about 0,43–0,47, a/l 0,36–0,44), body whorl somewhat swollen at periphery, whorls not shouldered, subsutural cord rather weak; axial ribs strong, evanescing on shoulder slope, 9–11 on penultimate whorl, crossed by thin, low, well-rounded spiral lirae, 17–20 on penultimate whorl, lip preceded by a strong varix; early part of spire deep yellowish-brown, body whorl pale yellow, base tinged with yellowish-brown (beachworn shells bright yellow with violaceous spire); protoconch breadth 1,00–1,05 mm. Attains about 10 mm.

Description: Shell claviform (b/l approximately 0,43–0,47, a/l 0,36–0,44), body-whorl tumid, base truncate, tapering, aperture relatively large; teleoconch whorls about 5, not shouldered, posterior half more or less strongly convex, with periphery at midwhorl, shoulder slope evenly concave, subsutural margin forming a rather weak cord, suture shallow, undulating, each whorl rising high up its predecessor; left side of base of body whorl slightly concave, fasciole present, no false umbilicus. Aperture oblong-ovate, greatest width just posterior to middle, siphonal canal




Figs 31–35. Tentacles and penis of some Crassispirinae (not drawn to scale). **31**, *Mauidrillia felina* sp. n.; **32**, *Funa asra* sp. n.; **33**, *Inquisitor isabella* sp. n.; **34**, *Calcatodrillia chamaeleon* sp. n.; **35**, *Naudedrillia mitromorpha* sp. n.

wide, its termination not indented; columella almost straight, parietal region concave, labial callus thick, its outer edge not raised, parietal pad large, constricting anal sinus; labrum moderately convex, with a slight stromboid notch, anal sinus deep, U-shaped, tilted slightly adapically.

Sculptured by strong axial ribs, crossed by much weaker, rounded spiral lirae; axials becoming weak on last quarter-whorl; lip preceded by a strong varix. Axial ribs opisthocline, straight, slightly arcuate on body whorl, projecting most at periphery, present but weak on shoulder slope and evanescing in subsutural region, crests of ribs sharply rounded, sides gradually sloping, intervals subequal to ribs; 8–9 ribs on 1st whorl, 9–11 on penultimate one. Spiral lirae 4–5 on 1st whorl, 17–20 on penultimate whorl, of which the anterior 8–10 are stronger than those in shoulder sulcus; base of body whorl with about 15 widely-spaced, declivous lirae, most subequal in strength.

Protoconch bluntly conical, of $1\frac{2}{3}$ to slightly over 2 whorls, usually terminating in a strong varix; 1st whorl strongly tilted and somewhat mammilliform, all whorls smooth except sometimes for a few weak axial riblets, crossed by feeble spiral striae, near termination; breadth 1,00–1,05 mm, height 0,88–0,98 mm (b/h 1,02–1,14).

Colour: Early part of spire typically deep yellowish-brown, somewhat paler on penultimate whorl, where ribs are pale yellow; body whorl pale yellow, base tinged with deep to strong yellowish-brown; occasionally almost uniform light yellowish-brown with paler ribs. Worn shells brilliant yellow with dark greyish-red spire. No periostracum.

Dimensions: 7,5 × 3,5 mm (holotype); largest adult paratype 9,9 × 4,4 mm (lip damaged and repaired), smallest (protoconch damaged) 5,8 × 2,9 mm.

Operculum (visible inside aperture of dried holotype) translucent, pale yellowish, with coarse growth-lines.

Range: Eastern Transkei to southern Natal, littoral to about 150 m, on sponge bottoms.

Type material (all NM: *MN,* unless otherwise stated): Holotype C7445/T3537, off Mtamvuna River, Transkei/Natal border (31°08,8′S, 30°16,0′E), 115 m, sponge, rocks. Paratype 1, C9564/T3642, juv., same data. Paratype 2, C7507/T3643, off Mtamvuna River, 120–140 m, sponge-rubble. Paratype 3, C7558/T3644, off Mtamvuna River, 137 m, rocks, sponges. Paratypes 4–6, C8179/T3645, Mbotyi, Transkei, beach-drift, worn adults, R. K., D. Herbert. Paratype 7, C7211/T3623, off Whale Rock, Transkei, 150–200 m, sponge-rubble. Paratype 8, B8861/T3636, off Margate, Natal, 100–110 m, sponge.

Notes: As a rule, this species is easily recognized by its bicoloured yellow and violet shell (most striking in beach-worn examples), also by its relatively strong spiral lirae and axial ribs which cross the shoulder sulcus, albeit weakly. The protoconch is naturally decollated in a single small but apparently adult paratype.

Of described species, *B. dichroma* appears to show some resemblance to *B. hadromeres* (Melvill, 1923) from the Caribbean; *dichroma* is more squat in shape, with weaker spiral lirae.

Etymology: *di* (two) + *chromos* (colour), Gr.

## **Nquma** gen. n.

Type species: *Pleurotoma rousi* Sowerby, 1886.

Diagnosis: Shell moderately small (12–20 mm), claviform with low spire (often decollated in adult), papilliform apex, relatively small aperture and short base, with a moderately strong fasciole; siphonal canal short, wide, its termination deeply notched, square-set; parietal pad large, angular, with somewhat lamellar growth-lines, constricting anal sinus; anal sinus moderately deep, narrowly and roundly U-shaped, its opening (in adult) greatly constricted and usually directed slightly abapically; stromboid notch weak; whorls usually shouldered, without a distinct subsutural cord (although sometimes slightly swollen below suture), axial ribs weak to strong, typically broad and shouldered, crossed by low spiral threads; sometimes with a prelabral varix; colour drab. Protoconch subcylindrical, blunt, of 2–2½ whorls, smooth except for weak axial riblets (and sometimes spiral striae) on last half-whorl. Operculum oblanceolate with acute apex, nucleus terminal. Radula crassispirine, of marginal plates only, shaft short, cutting edge not sharply defined, accessory limb fairly short, inserted into socket on underside of plate.

Notes: *Nquma* is allied to the extensive American genus *Crassispira* Swainson, 1840, which, however, contains large to medium-sized species, with a distinct to massive subsutural cord, an openly U-shaped anal sinus, a protoconch with well-developed axial riblets on its last whorl, and a dark brown to black ground colour, sometimes with a dark periostracum. None of the Western Hemisphere species appear to be naturally decollated, although this is characteristic of several West African species (*callosa* Kiener, 1841, *carbonaria* Reeve, 1843) which are sometimes referred to *Crassispira*. From *Buchema Nquma* differs in lacking a subsutural cord, and in its weak spiral sculpture and greatly constricted anal sinus (which resembles the Greek upper case letter omega).

Etymology: *nquma* = to behead (Zulu).

### Key to species of *Nquma*

1 Spiral sculpture of thin, rounded threads, with fine axial striae in intervals; axial ribs 7–9 on body whorl; early whorls seldom decollated..... **scalpta**

— Spiral sculpture of feeble grooves, no axial striae, axial ribs 9–13 on body whorl; adult always decollated..... **rousi**

### *Nquma rousi* (Sowerby, 1886) **comb. n.**

Figs 24, 49, 190–197

*Pleurotoma rousi* Sowerby, 1886: 6, pl. 1, fig. 22. Type locality: Port Elizabeth.
*Pleurotoma (Crassispira) rousi*; Sowerby, 1892: 5, pl. 1, fig. 3.
*Drillia rousi*; Turton, 1932: 20, pl. 4, no. 154; Barnard, 1958: 122.
*Drillia albotessellata* Smith, 1906: 26, pl. 7, fig. 3. Type locality: Port Shepstone.
*Clionella elizabethae* Bartsch, 1915: 16, pl. 4, fig. 1. Type locality: Port Elizabeth.

Diagnosis: Shell with decollated apex in adult (only 3–4 teleoconch whorls retained), b/l 0,39–0,48, a/l 0,35–0,44, whorls weakly to moderately shouldered; axial ribs moderately strong, 9–13 on penultimate whorl, no subterminal varix;

spiral sculpture of shallow, sometimes inconspicuous grooves, 3–6 below shoulder on penultimate whorl; patterned with light to dark brown (rarely brownish-grey) on a yellowish-white ground, which shows through largely as small spots (particularly on ribs). Protoconch breadth 0,90–1,00 mm, b/h 0,95–1,06. Attains about 19 mm.

Description: Shell claviform, apex always decollated in adult, with 3–4 teleoconch whorls retained, in adult b/l 0,39–0,48, a/l 0,35–0,44, aperture relatively large, base short, truncate; suture shallow, each whorl clasping high up preceding one; whorls feebly to moderately shouldered, shoulder at or just below posterior third, shoulder slope slightly concave, no definite subsutural cord, although sutural border may be slightly tumid; left side of base of body whorl shallowly concave to slightly convex, fasciole well-developed, sometimes with a slight false umbilicus. Aperture oblong-ovate, greatest width median, columella gently concave to almost straight, paries concave, siphonal canal wide, end more or less square-set, moderately to deeply notched; labial callus thick, edge slightly free over columella, forming a thick, laterally compressed pad posteriorly, which constricts entrance to anal sinus; labrum gently convex in side-view, without distinct stromboid notch, anal sinus moderately deep, in adult with greatly narrowed entrance, directed more or less outwards or slightly abapically.

Sculptured by moderately strong (occasionally fairly weak) axial ribs, crossed by shallow spiral sulci; no distinct varix; growth-lines fine. Axial ribs 7–8 on 1st whorl, 9–13 on penultimate and last whorl (weak to obsolete on body whorl in Natal form), ribs with sharply rounded crests and gradually sloping sides, opisthocline, equal to their intervals, evanescing on shoulder slope and base of body whorl (although they may reach the fasciole). Spiral grooves very shallow and inconspicuous in Cape individuals, slightly deeper in Natal examples; 3–6 sulci below shoulder, base with 4–7 feeble grooves plus 3–7 rostral lirae in Cape individuals, totalling 14–21 in Natal specimens; shoulder slope smooth, sometimes with faint spiral striae in Natal shells.

Colour: *(a)* Typical form: moderate to dark brown, flecked or mottled with yellowish-white, often forming a reticulate or streaky pattern, subsutural region, base of body whorl and often crests of ribs largely pale, subsutural region with flecks and wavy lines of brown; spiral grooves brown; protoconch and 1st teleoconch whorl strong brown; interior of aperture tinged with moderate brown. *(b)* Natal form: mottled and flecked with light greyish-yellowish-brown to medium olive-grey, base of body whorl and subsutural region yellowish-white, speckled or tinged with light orange-yellow, interior of aperture dark grey.

Protoconch somewhat cylindrical, of 2–2½ whorls, 1st depressed, second weakly convex, suture shallow, smooth except for weak axial ribs near termination; breadth 0,90–1,00 mm, height 0,85–1,00 mm (b/h 0,95–1,06).

Dimensions: Largest example measured 18,7 × 8,4 mm, smallest 12,1 × 5,5 mm; 20 × 8 mm (Sowerby).

Operculum shaped as in *Naudedrillia praetermissa* (Fig. 3), translucent moderate orange-yellow to deep orange.

Radula (Fig. 49) of about 40 rows of marginal plates, blade wide.

Range: Cape Agulhas to Natal south coast, intertidal to about 35 m.

Locality data (selected, all NM): AGULHAS REGION: Cape Agulhas (A2802: Mrs C. M. Connolly). EASTERN CAPE: Jeffreys Bay (5960: R. K.); Algoa Bay (616: H. C. Burnup; 6937: W. Falcon; 5962: R. K.); Port Alfred (B668: E. K. Jordan; B4376: H. Becker); East London (A2799, A2801: Mrs C. M. Connolly; 6936: H. C. Burnup); Gonubie (5961: R. K.); off Gonubie Point, 30 m, marine growths (B8511: *MN*). TRANSKEI: Qolora River Mouth (C3420: R. K.); Sandy Point (C3724: R. K.); Shixini (C6240: R. K.); Dwesa (C5995: R. K.); Banyana River mouth (B1348: R. K.); Nthlonyane (6938: R. K.); Xora (5963: R. K.); off Mncwasa Point, 32–35 m, fine sand (C2705: *MN*); Coffee Bay (5147: R. K.; B6828: W. Tyson); off Whale Rock, 20–26 m, sand and gorgonians (C7241: *MN*); Lwandile/Mdumbi (C182: R. K., R. Fregona); Hluleka (C1421: R. K.); Mgazi (5146: R. K.); Mbotyi (4395: R. K.; C8183: R. K., D. Herbert); Port Grosvenor (B910: R. K); Mzamba (B4671, 5145: R. K.; D2664: R. K., D. Herbert). NATAL: Port Shepstone (B2973, 6931, 3278: H. C. Burnup); Umkomaas littoral (6934: H. C. Burnup); Aliwal Shoal, off Umkomaas, 20–30 m., living (D2322: D. Herbert).

Type material: Holotype of *P. rousi* in OUM, of *Clionella elizabethae* USNM 18796 (fide Bartsch). Five syntypes of *Drillia albotessellata*, NM 608/T494, H. C. Burnup collection.

Notes: The apical whorls in this species are progressively discarded and sealed off with growth; the protoconch itself is lost when about 4 teleoconch whorls have been developed.

In the eastern Cape *N. rousi* may occasionally be found buried in sand under rocks and along the edge of LST pools, but further east it lives infratidally.

*N. rousi* shows marked geographic variation. The typical Cape form is shouldered and relatively broad (b/l 0,45–0,47), with strong ribs and feeble spiral grooves (sometimes obsolete), and is speckled with orange-brown and off-white. In Natal (form *albotessellata*) the shell is narrower (b/l 0,40–0,46), with weakly shouldered whorls, axial ribs are more numerous, but tend to be obsolete on the last whorl, spiral sulci are deeper and whorls are flecked with brownish-grey. Within Transkei the two extremes intergrade so gradually that two subspecies cannot be recognized.

### **Nquma scalpta** sp. n.

Figs 50, 198–200

Diagnosis: Shell with decollated apex in shallow-water examples only, b/l 0,38–0,44, a/l 0,33–0,35, whorls strongly shouldered; axial ribs strong, 7–9 on penultimate whorl, with a strong subterminal varix; spiral sculpture of fine, rounded threads, 8–11 on penultimate whorl; light yellowish-brown, flecked with cream and light orange-brown, usually with an orange-brown mark above shoulder of each rib. Protoconch breadth 0,85–0,95 mm, b/h 1,06–1,36. Attains about 19 mm.

Description: Shell claviform (b/l 0,38–0,44, a/l 0,33–0,35), apex narrowly papilliform (decollate in shallow-water examples), base short, truncate, teleoconch whorls about 6; suture shallow, each whorl clasping high up the preceding one,

shoulder angular, at or slightly above midwhorl, shoulder slope moderately concave, no distinct subsutural cord, left side of base of body whorl shallowly concave, fasciole strong, with a slight false umbilicus. Aperture oblong-ovate, greatest width median, columella almost straight, parietal region concave; siphonal canal wide, curved slightly to left, end weakly oblique to square-set, moderately notched; labial callus thick, edge slightly free over columella, forming a thick, laterally compressed pad posteriorly, which greatly constricts entrance to anal sinus; labrum gently convex in side-view, without distinct stromboid notch, anal sinus moderately deep, roundedly U-shaped, with greatly narrowed entrance, directed outwards or slightly abapically.

Sculptured by strong axial ribs, crossed by narrow spiral lirae; labrum preceded by a strong, rounded, often wide varix; growth-striae fine, but regular, rendering spiral grooves minutely pliculate. Axial ribs 8–9 on 1st whorl, 7–9 on penultimate and body whorls (including varix), slightly opisthocline, with rounded crests and gradually sloping sides, subequal to intervals, evanescing on shoulder slope, on body whorl reaching fasciole. Spiral lirae 6–7 on 1st whorl, 8–11 on penultimate whorl, usually absent above shoulder, but sometimes feeble striae on shoulder slope, 16–20 lirae on base (including rostrum).

Colour light yellowish-brown, flecked with white and brownish-orange to light orange-yellow, particularly below suture, and usually with a brown spot above shoulder of each rib, 1–2 shoulder lirae pale where cross axials, intervals between ribs and a spiral zone at parietal level tinged with light brown or yellowish-grey; apex usually moderate brown, occasionally light orange-yellow; aperture moderate brown to pale yellowish-pink.

Protoconch somewhat cylindrical and papilliform, of two whorls, smooth, except for faint axial riblets and about 6 feeble spiral threads terminally; breadth 0,85–0,95 mm, height 0,70–0,80 mm (b/h 1,06–1,36).

Dimensions: 14,9 × 6,5 mm (holotype); largest paratype 18,5 mm (lip and protoconch broken); smallest adult paratype 11,6 × 5,0 mm; decollated paratype 17,1 × 7,2 mm.

Operculum as in *rousi*, but translucent deep yellowish-brown.

Radula (Fig. 50) of about 45 rows of marginal plates.

Range: Southern Mozambique to East London, littoral (very rarely) to about 150 m.

Type material (all NM): Holotype, NM D1930/T3572, off Port Edward area (31°05,8′S, 30°18,8′E), Natal, 140 m, live sponges, *MN*. Paratypes: EASTERN CAPE: Paratype 1, B8201/T3691, off East London, 90 m, coarse sand, sponges, gorgonians, *MN*. TRANSKEI: Paratype 2, C4959/T3678, off Kei River, 85 m, sponge-rubble, coarse sand, *MN*. Paratype 3, C3941/T3680, off Qolora River, 114 m, sponge-rubble, *MN*. Paratype 4, C4365/T3692, off Stony Point, 150–152 m, calcareolite and corals, *MN*. Paratype 5, C1991/T3693, off Mbashe River, 75 m, calcareous nodules, *MN*. Paratype 6, C9569/T3694 (now consisting of radula slide M191, operculum and shell apex), off Nthlonyane, 30 m, coarse brown sand, calcareous debris, *MN*. Paratypes 7–9, C2830/T3695, C7219/T3696, off Whale Rock, 150–200 m, sponge-rubble, *MN*. Paratype 10, C3279/T3697, off Ubombo,

135–165 m, sponge-rubble, *MN*. Paratype 11, C423/T3698, off Port Grosvenor, 100–110 m, coarse sand, some mud, solitary corals, shells, *MN*. Paratypes 12–15, C5262/T3681, off Mzamba River, 100 m, sponge-rubble, *MN*. Paratype 16, C7515/T3699, off Mtamvuna River, 120–140 m, sponge-rubble, *MN*. Paratype 17, 5148/T3700, Mtamvuna River mouth, beach-drift, W. Falcon. NATAL: Paratypes 18–19, D1377/T1701, off Port Edward, 120–125 m, live sponges, *MN*. Paratype 20, D914/T3702, off Port Edward, 125 m. live sponges, *MN*. Paratypes 21–23, D1414/T3703, off Port Edward, 140 m, live sponges, *MN*. Paratype 24, B5452/T3577, off Durban Bluff, 20–22 m, sand, R. K. Paratypes 25–28, 6933/T3679, Durban littoral, H. C. Burnup. ZULULAND: Paratype 29, A251/T3676, off Zululand, *ex pisce*, A. Visage. Paratype 30, A5632/T3704, off Sodwana Bay, *ex pisce*, J. P. Marais. Paratype 31, B3095/T3705, Ledsman Shoal, 100 m. A. Connell. Paratype 32, D8474/T3934, off Jesser Point, 70 m, medium sand, *MN*. Paratype 33, D6729/T3935, same data, 68 m, sponge, coral-rubble. MOZAMBIQUE: Paratype 34, G5006/T3706, North Reef, Bazaruto Is., littoral, Mrs E. Roscoe.

Notes: The bathymetric range of *N. scalpta* is remarkable, and indicates it to be a subtropical species, living inshore in the warmer waters of Natal and Mozambique, but further south restricted to the outer continental shelf, which is under the influence of the warm Agulhas current. Littoral and shallow-water examples resemble typical Cape *N. rousi* in their decollated apex, only 3–4 teleoconch whorls being retained. Compared with *rousi*, axial ribs are fewer (7–9 on body whorl in *scalpta*, instead of 9–13), and stronger, with a more angular shoulder, spiral sculpture consists of thin, rounded lirae (instead of feeble grooves), whose intervals are crossed by fine axial striae (absent in *rousi*) and protoconch whorls are more rounded; the operculum of *rousi* is more orange in colour.

Etymology: *scalptus* = engraved, L.

## *Mauidrillia* Powell, 1942

Figs 31, 48, 201–202

*Mauidrillia* Powell, 1942: 85. Type species (o.d.) *Mangilia praecophinodes* Suter, 1917.

Diagnosis: Shell moderately small (7–18 mm), claviform, with a broad, moderately shallow anal sinus, occupying most of shoulder; stromboid notch shallow or absent; sculpture of dense spiral lirae, axial sculpture often peripheral or restricted to early whorls, no subsutural cord or parietal pad. Protoconch globose, of $1\frac{1}{2}$–2 whorls, smooth except sometimes for terminal riblets. Operculum oblanceolate with terminal nucleus. Radula resembling that of *Inquisitor*, of relatively small marginal plates only, with a short shaft, rather poorly defined cutting edge and long, slender accessory plate. Tentacles short, with eyes on swellings occupying half their length; sperm duct opening through large retractile papilla at tip of penis.

Notes: The eternal problem of reconciling Recent molluscan species with fossil-based genera is a vexing one, and it is quite possible that apparent resemblances are, in the present case, the result of convergence. I am nevertheless unwilling to propose a new taxon for the Recent South African species here described. Powell (1966: 87) restricted *Mauidrillia* to species from the Eocene to Pliocene of Australasia, with three doubtful representatives in Japan and Okinawa. Although

the local representative has much weaker axial ribs than its Tertiary congeners, at least two of the latter (*pullulascens* Tenison-Woods, 1877, and *partinoda* Powell, 1944, from the Miocene of Victoria and Tasmania) show a reduction in ribbing, this being developed only on their spire whorls. Also, whereas the protoconch in *Mauidrillia* was described (Powell 1966) as consisting 'of two smooth whorls', many of the Tertiary species have only about 1½ whorls, as in *M. felina* nov., and at least one (*M. secta* Powell, 1944) has similar brephic axials.

*Mauidrillia felina* sp. n.

Diagnosis: Shell with b/l 0,38–0,39, a/l 0,35–0,40, whorls with bluntly angular periphery, median on early whorls, above middle on later ones; sculptured by dense spiral lirae, 19–23 on penultimate whorl, peripheral region crossed on first 3 whorls by weak axial riblets, obsolete thereafter; colour uniform very pale buff; protoconch with axial riblets near termination, breadth 1,20–1,30 mm. Attains 12,0 mm.

Description: Shell claviform (b/l 0,38–0,39, a/l 0,35–0,40), with a moderately produced, obliquely truncate base, suture moderately deep, teleoconch whorls about 5; each whorl bluntly angular, angle median on early whorls, posterior to middle on later ones; shoulder slope slightly concave, no subsutural cord; left side of base of body whorl concave with moderately strong fasciole and shallow false umbilicus. Aperture oblong-ovate, greatest width at about posterior third, siphonal canal wide, parallel-sided, termination very shallowly indented; parietal callus present but depressed and flattened, without a pad or nodule, labium gently sigmoid, columella medially convex, meeting parietal region in an even curve; labrum thin, in side-view convex, with a shallow stromboid notch and moderately shallow, openly U-shaped anal sinus.

Sculptured by dense spiral lirae with weak axial riblets on early whorls; growth-lines give lirae a slightly milled appearance; no varices. Spiral lirae 8–11 on 1st whorl, where they are weak, particularly below suture, 3rd to 5th thread the strongest; penultimate whorl with 19–23, narrower than their intervals, peripheral one not stronger than the others; base of body whorl with 24–26 lirae, closer on rostrum than elsewhere. Axial ribs largely restricted to periphery, opisthocline, widely spaced, arcuate on shoulder slope, 12–13 on 1st whorl, obsolete by end of third whorl.

Uniform pale to light orange.

Protoconch globose, of about 1½ convex whorls, 1st one depressed; smooth except for a series of dense, arcuate axial riblets near termination of last whorl; breadth 1,20–1,30 mm, height 0,95–1,10 mm (b/h 1,18–1,32).

Dimensions: 10,8 × 4,2 mm (holotype); 12,0 × 4,6 mm (largest paratype).

Radula (Fig. 48) and body (Fig. 31) as described under genus; approximately 21 rows of teeth.

Range: Continental slope of western Transkei, 300–446 m.

Type material: Holotype NM C8023/T3518, radula-slide M186; off Shixini Point (32°31,2′S, 28°52,2′E), 300 m, coarse sand, broken shell. Paratypes 1–4, NM C6564/T3519, off Qora River, 300 m, coarse sand, some broken shell. Paratype 5,

NM C4615/T3520, off Qolora River, 440–446 m, fine sand and stylasterids. Paratype 6, NM C4364/T3521, off Stony Point, 395 m, sponge and stone.

Etymology: *felina* = cat-like (L.)

**Psittacodrillia** gen. n.

Type species: *Pleurotoma bairstowi* Sowerby, 1886.

Diagnosis: Shell moderately small (9–15 mm), biconic-claviform to claviform, with relatively low, straight-sided spire, more or less papilliform apex, and short base, without a distinct fasciole; siphonal canal short, wide, its termination square-set, not notched; parietal pad large, angular, with somewhat lamellar growth-lines, constricting anal sinus; anal sinus moderately shallow, asymmetrically U-shaped, directed slightly abapically; stromboid notch absent; whorls not shouldered, without a distinct subsutural cord, axial ribs fairly weak, evanescing on shoulder slope, crossed by low, dense spiral threads; no varices, although sometimes a slight swelling behind lip; usually vividly coloured, with pale ribs on a deep brown to orange ground; a lacquer-like periostracum present in type-species at least. Protoconch narrowly domed, of approximately 2 whorls, smooth except (typically) for spiral striae and sometimes weak axial riblets on last half-whorl. Operculum and radula unknown.

Notes: I hesitate to describe a turrid genus on shell characters alone, but this species-group cannot be referred satisfactorily to any known taxon. From *Naudedrillia, Psittacodrillia* differs in the shallow anal sinus, strong parietal nodule, non-shouldered whorls, vivid colour pattern, lack of a subterminal varix, and less oblique, unnotched termination to the siphonal canal. Compared with *Buchema*, it lacks a distinct subsutural cord, subterminal varix and fasciole. Two of the three species here included (*diversa* and *bairstowi*) are very similar to one another, but the third, *Drillia albonodulosa*, differs in form, notably in its vestigial varix and fasciole, and in the slight subsutural swelling, and may eventually prove to be unrelated (perhaps a *Buchema*).

The type species has been collected alive on infratidal corallines (pers. comm. Mrs S. Muller), but no soft parts are presently available.

Etymology: *psittacus* (a parrot) + *drillia* (stem name for many clavine genera), L.

Key to species of *Psittacodrillia*

1 Maximum width of shell anterior to middle, apex not papilliform, spire whorls distinctly convex, slightly swollen below suture; dark orange-brown, ribs with peripheral white spots ..... **albonodulosa**

— Maximum width of shell more or less median, apex papilliform, spire whorls weakly convex, not swollen below suture; colour not as above, or each rib white ..... 2

2 Orange with pale ribs and brown intervals; broader (b/l 0,44–0,47); spiral threads overall ..... **diversa**

— Deep brown, with or without pale ribs, or pale to orange-brown with white ribs and darker brown intervals; narrower (b/l 0,39–0,44); spiral threads weak or obsolete, often restricted to base ..... **bairstowi**

*Psittacodrillia diversa* (E. A. Smith, 1882) **comb. n.**

Figs 21, 203–206

*Pleurotoma (Clavus) diversa* Smith, 1882: 207; Sowerby, 1886: 5. Type locality unknown (here designated as Algoa Bay).
*Pleurotoma (Clionella) diversa*; Sowerby, 1892: 6, pl. 4, fig. 79.
*Drillia diversa*; Turton, 1932: 22; [*partim*] Barnard, 1958: 121.
*Crassispira diversa*; Kilburn & Rippey, 1982: 117.
*Drillia sowerbyi* (*non* Turton, 1932); Barnard, 1959: 124.

Diagnosis: Shell biconic-claviform with greatest width more or less median, b/l 0,44–0,47, a/l 0,36–0,42, aperture relatively large, whorls weakly convex anteriorly, slightly concave posteriorly, not swollen below suture; no fasciole; anal sinus moderately shallow, opening directed slightly anteriorly; axial ribs low, 9–11 on penultimate whorl, spiral lirae fine, over whole external surface, 16–20 on penultimate whorl; orange, ribs pale, with brown intervals; protoconch breadth 1,35 mm. Attains 14,9 mm.

Description: Shell biconic-claviform (b/l 0,44–0,47, a/l 0,36–0,42), spire orthoconic, aperture relatively large, teleoconch whorls about 4, suture shallow, each whorl rising high up its predecessor; whorls anteriorly weakly convex, not shouldered, shoulder slope very shallowly concave, no distinct subsutural cord, periphery of body whorl strongly convex, left side of base slightly concave, fasciole not developed, without a distinct false umbilicus. Aperture oblong, greatest width at about posterior third, siphonal canal wide, its end not notched; columella only slightly convex, parietal region concave; callus moderately thick, on columella with slightly free edge, in parietal region thinner except for a large posterior pad, which constricts entrance to anal sinus; labrum in side-view gently convex, without a stromboid notch; anal sinus moderately shallow, asymmetrically U-shaped, its opening directed somewhat abapically.

Sculptured by moderately low, short, rounded axial ribs, crossed by fine spiral threads; no varices. Axial ribs subequal to their intervals, with rounded crests and gently sloping sides, opisthocline, evanescing on shoulder slope and at level of parietal pad, obsolete on last third of body whorl; 1st half-whorl with fine, arcuate riblets, little stronger than the spiral sculpture, followed by 10–12 ribs on early whorls, 9–11 on penultimate one. Spiral lirae fine and rapidly worn away; 9–12 on 1st whorl, 16–20 on penultimate one, 20–26 on base of body whorl.

Colour light to moderate orange overall, except for crests of ribs, which are paler, and, as a rule, their intervals, which are strong brown. Periostracum lacquer-like, brown.

Protoconch (Fig. 21) domed, limits not apparent, but evidently of about 2 whorls, last whorl with faint spiral striae and traces of very fine, arcuate axial riblets terminally; breadth 1,35 mm, height 0,95–1,15 mm (b/h 1,17–1,42).

Dimensions: 11,3 × 5,3 mm; attains 14,9 mm (lip broken).

Range: Eastern Cape and western Transkei littoral.

Locality data (all NM): EASTERN CAPE: Jeffreys Bay (5928: R. K.); Port Alfred (5927, A1591: R. K.; B662: E. K. Jordan; 6693: W. Falcon; 7007: H. C. Burnup); East London (A2837: Mrs C. Connolly; A609: R. K.); off Cove Rock, 22 fath.

(SAM A354: *PF*). TRANSKEI: Dwesa (C6086: R. K.); off Mncwasa Point, 32–35 m, fine sand, a broken shell (C2699: *MN*).

Type material: Two worn syntypes, one juvenile, BM(NH) 1874.5.26.4. The adult, here designated as lectotype (Fig. 205), measures 12,0 × 5,3 mm.

Notes: All specimens examined are more or less beach-worn or damaged. The two dredged examples retain the periostracum (Fig. 206). One of these was misidentified by Barnard (*loc. cit.*) as *Drillia sowerbyi* Turton, 1932 [= *Crassiclava layardi* (Sowerby, 1897)].

*Psittacodrillia bairstowi* (Sowerby, 1886) **comb. n.**

Figs 207–209

*Pleurotoma bairstowi* Sowerby, 1886: 6. Type locality: Port Elizabeth.
*Pleurotoma (Clionella) bairstowi*; Sowerby, 1892: 6, pl. 1, fig. 6.
*Drillia bairstowi*; Turton, 1932: 22.
*Crassispira bairstowi*; Kilburn & Rippey, 1982: 117, pl. 28, fig. 7.
*Drillia diversa* [*partim*]; Barnard, 1958: 121.

Diagnosis: Shell biconic-claviform with greatest width more or less median, b/l 0,39–0,44, a/l 0,34–0,41, aperture relatively large, whorls weakly convex anteriorly, slightly concave posteriorly, not swollen below suture; no fasciole; anal sinus moderately shallow, opening directed outwards; axial ribs low, 8–11 on penultimate whorl, spiral lirae fine, feeble to obsolete, often restricted to base; two colour forms: *(a)* dark brown, with or without paler ribs, *(b)* base of body whorl light brown, posterior part and spire deep brown with white ribs, subsutural region blotched and flecked with brown on white; protoconch breadth 1,20–1,25 mm. Attains 12,5 mm.

Description: Shell biconic-claviform (b/l 0,39–0,44, a/l 0,34–0,41), spire initially coeloconic, later slightly cyrtoconic, apex somewhat papilliform, aperture moderately large; teleoconch whorls about 5, suture shallow, each whorl rising high up preceding one, whorls gently convex with median periphery, not shouldered, shoulder slope shallowly concave, no distinct subsutural cord; left side of base of body whorl slightly concave, fasciole not developed, false umbilicus absent or very slight. Aperture oblong, greatest width at about posterior third, siphonal canal wide, its end not notched; columella only slightly convex, parietal region concave; callus moderately thick, on columella with slightly free edge, in parietal region thinner except for a large posterior pad, which constricts entrance to anal sinus; labrum in side-view gently convex, without a stromboid notch; anal sinus moderately shallow, asymmetrically U-shaped, its opening directed outwards.

Sculptured by short, low to very low, rounded axial ribs, usually crossed by very fine spiral threads (sometimes obsolete), lip not preceded by a distinct varix, Axial ribs equal to/wider than intervals, sides gently sloping, opisthocline, evanescing rapidly on shoulder slope and on base at level of parietal pad, weak to absent on last third of body whorl; about 9 on early whorls, 8–11 on penultimate one. Spiral threads weak or obsolete, sometimes traceable only on early whorls, generally 12–18 on base of body whorl.

Two intergrading colour forms: *(a)* dark brown, either uniform or with paler ribs, or *(b)* base of body whorl moderate orange to light brown, axial ribs white, with

moderate to strong brown intervals, with a zone of that colour at level of parietal nodule (demarcating upper limit of brown base); subsutural region white, blotched with moderate to strong brown; external pattern visible inside aperture.

Protoconch narrowly domed, of about 2 whorls, apex somewhat depressed, rest moderately convex, last quarter whorl apparently with feeble axial riblets and spiral striae, but limits obscure; breadth 1,20–1,25 mm, height 1,05–1,10 mm (b/h 1,09–1,19).

Dimensions (adults): 11,2 × 4,6 mm, 9,2 × 4,0 mm. Attains at least 12,5 mm (apex worn); 14 × 5 mm (Sowerby).

Range: False Bay to eastern Transkei, littoral.

Locality data (all NM): FALSE BAY: Strandfontein, juvenile (A3957: Mrs C. M. Connolly). EASTERN CAPE: Algoa Bay (B6400: F. Graeve); Port Alfred (A2167: R. K.; B2972: H. Becker; B3221: E. K. Jordan; 628: H. C. Burnup); East London (5935: R. K.; B6833: Albany Mus.); Kwelera (A2828: Mrs C. M. Connolly); Bulugha (5936: R. K.). TRANSKEI: Kei River mouth (C3565: R. K.); Dwesa (C6048: R. K.); Banyana River mouth (B1383: R. K.); Xora (5934: R. K.); Lwandile/Mdumbi (C153, C155: R. K., R. Fregona); Hluleka (C1422: R. K.); Mgazi (5933: R. K.; B7450: E. K. Jordan); Mbotyi (C8177, C8184: R. K., D. Herbert); Mzamba (B4675: R. K.; B229: J. P. Marais).

Type material: Probably BM(NH) but cannot at present be located (pers. comm. Ms K. Way).

Notes: Surf-tumbled shells of this strongly patterned species are not uncommon in beach-drift, but no living examples or even truly fresh shells have been seen. The typical dark brown form (Fig. 207) is the rarer of the two colour morphs. Barnard (1958) erred in synonomizing this species with *Psittacodrillia diversa* (Smith, 1882), which has a broader, more convex body whorl, less papilliform apex, more strongly developed and numerous spiral lirae, and distinctive orange colour.

### *Psittacodrillia albonodulosa* (E. A. Smith, 1904) **comb. n.**

Figs 210–212

*Drillia albonodulosa* Smith, 1904*a*: 27, pl. 2, fig. 3; Turton, 1932: 22. Type locality Port Alfred.
*Crassispira albonodulosa*; Kilburn & Rippey, 1982: 117.
*Drillia diversa* (partim); Barnard, 1958: 121.

Diagnosis: Shell claviform with greatest width anterior to median, b/l 0,44–0,46, a/l 0,33–0,39, aperture relatively small, whorls convex anteriorly, moderately concave posteriorly, slightly swollen below suture; fasciole weak; anal sinus shallow, opening directed slightly anteriorly; axial ribs moderately strong, 9–11 on penultimate whorl, spiral lirae fine, coarser on base, covering whole external surface, 8–10 on penultimate whorl; deep orange-brown, ribs with a row of white peripheral spots; protoconch breadth 1,08 mm. Attains 9,0 mm.

Description: Shell claviform (b/l 0,44–0,46, a/l 0,33–0,39), greatest width anterior to middle, spire initially orthoconic, later slightly cyrtoconic, apex not papilliform; teleoconch whorls nearly 5, suture moderately shallow, sometimes undulating, whorls moderately convex with periphery at or slightly below median, not

shouldered, shoulder slope moderately concave, subsutural region slightly swollen; left side of base of body whorl slightly concave, fasciole weak, occasionally with a very slight false umbilicus. Aperture oblong-ovate, greatest width more or less median, siphonal canal wide and shallow, its end not notched; columella straight to slightly convex, parietal region concave; callus moderately thick, outer edge not free, parietal pad small to massive, filling posterior angle of aperture and constricting entrance to anal sinus; labrum in side-view gently convex, without a stromboid notch; anal sinus shallow, asymmetrically U-shaped, its opening directed abapically.

Sculptured by short, rounded, fairly strong axial ribs, and fine spiral lirae, lip preceded by a very weak varicoid swelling. Axial ribs somewhat wider than intervals, crests rounded, sides gently sloping, opisthocline, straight, evanescing on shoulder slope and on body whorl at level of parietal/columella junction, weak to absent on last third of body whorl; about 10 on early whorls, 9–11 on penultimate one. Spiral lirae difficult to trace on early whorls; on penultimate whorl 8–10 thin, well-raised threads on shoulder slope plus 7–12 flatter and wider ones below suture; base of body whorl with about 16, more or less wide, somewhat declivous lirae.

Colour deep brown with a series of yellowish-white spots, restricted to ribs, except on later part of body whorl where they may form a continuous band; protoconch pale.

Protoconch bluntly conical, of slightly over 2 whorls, apex somewhat depressed, evidently smooth except for a few rather strong axial riblets preceding termination; breadth 1,08 mm, height 1,05 mm (b/h 1,03).

Dimensions: 8,5 × 3,9 mm; 9,0 × 4,0 mm (protoconch worn).

Operculum, radula and soft parts unknown.

Range: Port Alfred to Natal south coast, littoral.

Locality data (all NM): EASTERN CAPE: Port Alfred (5926: R. K.; 2201: H. Burnup; B4395: H. Becker; B661: E. K. Jordan; B6814: Albany Mus.); East London (5925: R. K.); Kwelera (A2840: Mrs C. Connolly). TRANSKEI: Mzamba (B4689: R. K.; B228: J. P. Marais). NATAL: Shelley Beach, S. of Port Shepstone (B4203: Mrs D. Cock).

Type material: Holotype presumably in BM (NH).

Notes: Known only from beach-worn shells. Generic position doubtful; possibly a *Buchema* or even a member of the Drilliinae.

## *Inquisitor* Hedley, 1918

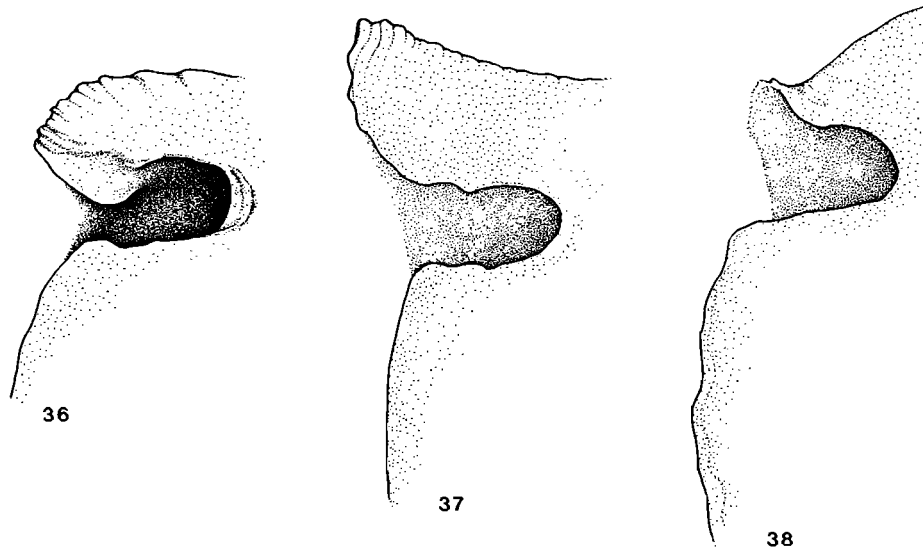
*Inquisitor* Hedley, 1918: M79. Type species (o.d.) *Pleurotoma sterrha* Watson, 1881.

Diagnosis: Shell moderately small to fairly large, claviform with high, acute spire and moderately produced, obliquely truncate base, tip of siphonal canal seldom deeply indented; fasciole usually well-developed in adult; labrum thin, although generally a strong varix preceding it, anal sinus deep, varying in shape, situated on shoulder slope, bordered below by a weakly alate expansion of lip; parietal callus forming a small to massive pad or nodule in posterior angle of aperture, generally constricting entrance to anal canal; subsutural cord more or less strong, shoulder

sulcus distinct to deep; axial ribs well-developed, stopping at shoulder; often vividly patterned with brown. Protoconch narrowly domed to conical, 2–5 whorls, smooth, except sometimes for a few weak axial riblets near termination. Operculum oblanceolate with terminal nucleus. Radula crassispirine, marginal plates with relatively short shaft, single somewhat ill-defined cutting edge and long accessory limb.

Notes: The genus *Inquisitor* is here applied in a more restricted sense than that used by previous workers. Firstly, Powell (1966: 79) incorrectly synonymised with it *Ptychobela* Thiele, 1925. The radula of the type species of *Ptychobela, Pleurotoma crenularis* (*auct., non* Lamarck, 1816) [= *Murex nodulosus* Gmelin, 1791], is borsoniine (cf Thiele 1929: text fig. 445). Secondly, two further types of radulae are present among the *Inquisitor*-like species here studied. In one, the marginal plates have a short shaft and single cutting edge (Figs 42–44). Similar teeth occur in the type species of *Inquisitor, I. sterrha* (Watson, 1881) from the western Pacific (pers. comm. Mrs V. O. Maes). In the second group, here recognised as genus *Funa* gen. n., the marginal plates are not only many fewer, but have a very long shaft and a double cutting edge (Figs 46–47), resembling the plates found in the genus *Naudedrillia*.

The genus *Inquisitor*, as here restricted, shows great variation in shape of the anal sinus and in protoconch type. Two types of protoconch, presumably representing different developmental modes, occur in *Inquisitor* species from southern Africa and Mozambique: *(a)* Narrowly domed or bluntly conical with approximately two whorls (e.g. *I. aesopus, I. isabella, I. latiriformis, I. cerithina*); *(b)* More conical, with about 3 whorls (*I. nodicostatus*). Intergradation between the two protoconch types was discussed by Powell (1966: 79).




Figs 36–38. Anal sinus in some *Inquisitor* and *Funa* species. **36**, *Inquisitor nodicostatus* sp. n.; **37**, *I. arctatus* sp. n.; **38**, *Funa asra* sp. n.

Three basic types of anal sinus occur: *(a)* slot-like (i.e. U-shaped with parallel sides, *(b)* U-shaped with constricted entrance, ie shaped like the Greek upper-case letter omega), and *(c)* openly U-shaped, with diverging sides, directed slightly adapically. A rather slot-like sinus occurs in the type species of the genus, and in *I. arctatus* and *I. latiriformis*. One local species, *I. nodicostatus*, also appears to possess a type *(b)* sinus, but the constriction is actually caused by the large parietal nodule protruding into the sinus, which is basically slot-like. The third type of anal sinus is found in *I. isabella* and *I. cerithina*.

Key to species of *Inquisitor* in southern Africa and Mozambique

1 All spiral lirae with conspicuous pale gemmules ..... **cerithina**
— Not as above ..... 2
2 Parietal nodule tongue-shaped, projecting adapically; patterned with a conspicuous median brown band ..... **arctatus**
— Parietal nodule angular or rounded, projecting outwards ..... 3
3 Terminal varix dorsal; intervals between spiral lirae without intermediary threads (rarely an occasional one) ..... 4
— Terminal varix behind lip; intervals between spiral lirae each with 2–4 intermediary threads ..... **latiriformis**
4 Entrance to anal sinus very strongly constricted; spiral lirae more or less equal in width to their intervals, and form conspicuous nodules on ribs; shoulder sulcus with spiral threads ..... **nodicostatus**
— Anal sinus openly U-shaped; intervals between spiral lirae narrow, ribs inconspicuously nodose; shoulder sulcus with a median groove ..... **isabella**

**Inquisitor nodicostatus** sp. n.

Figs 36, 42, 213–214

*Crassispira aesopus* (*non* Schepman, 1913); Kilburn, 1973: 572, fig. 13a.

Diagnosis: Shell moderately large (55 mm), b/l 0,27–0,33, a/l 0,27–0,36, whorls with a rounded shoulder, siphonal canal moderately long, tip very obliquely truncate, with very shallow notch; aperture narrow, fasciole sometimes fairly strong, labrum weakly crenulate at most, stromboid notch very slight, anal sinus roundly U-shaped with greatly constricted opening, parietal nodule very large, angular, projecting outwards, situated at suture; subsutural cord massive, equal in width to deep, concave shoulder sulcus; axial ribs strong, moderately opisthocline, terminating at sulcus, 12–15 on penultimate whorl, bearing strong transverse nodules where crossed by spiral cords, which in rib intervals are somewhat tabulate and equal to their interstices in width, 4–6 spirals below shoulder on penultimate whorl, 3–5 fine threads in sulcus; intermediary spirals few or absent, with no microspirals, growth-threads inconspicuous; terminal varix about one-quarter whorl back from lip, an occasional varix on spire. Brownish-buff with subsutural region and a median zone cream, varices followed by an axial brown blotch. Protoconch evidently conical of at least 3 whorls, breadth about 1,1 mm.

Description: Shell narrowly claviform, b/l 0,27–0,33, a/l 0,27–0,36, with a narrow aperture and moderately long, fairly broad rostrum, bent slightly to right and

terminating very obliquely; nearly 11 teleoconch whorls; suture moderately deep; whorls convex, roundly shouldered with median periphery, a deep, narrow, concave shoulder sulcus and strong, angular subsutural cord (which in apical view is slightly undulating), cord and sulcus more or less equal in width; left side of base of body whorl concave, fasciole sometimes fairly strong, false umbilicus shallow but distinct. Aperture narrowly pyriform, greatest width at about posterior third, lips equally concave, columella almost straight, siphonal canal moderately wide, expanding terminally and opening slightly to right, very shallowly indented; labial callus thick, its outer edge free, with a large, pointed, outwardly projecting parietal tubercle, situated at suture and intruding into opening of anal sinus which it constricts; edge of labrum gently convex in side-view, not or only feebly crenulated, with a slight, very shallow indication of a stromboid notch, anal sinus deep, shaped like the Greek letter Omega, bordered below by a slightly alate angle.

Sculptured by strong axial ribs, ending abruptly at shoulder, crossed by weaker spiral cords, which form conspicuous transverse nodules where they cross; body whorl with a strong, rounded varix about one-quarter whorl back from lip, spire also with an occasional varix; no spiral microsculpture, growth-lines coarse and regular but inconspicuous, forming fine plicules below suture. Axial ribs more or less equal to their intervals, with strongly rounded to somewhat angular crests and sloping sides (the leading face somewhat steeper than the trailing one), moderately opisthocline, straight on spire, gently sinuous on last whorl, extending well onto rostrum; 8–9 ribs on 1st whorl, 12–15 on penultimate one, becoming weak and irregular after subterminal varix. Spiral cords relatively low and somewhat tabulate where they cross the rib intervals, subequal in strength to one another and to their interstices, except in shoulder sulcus, which bears 3–5 fine, close threads, and on crests of ribs where cords expand slightly to form rounded nodules; intervals between spirals with only an occasional intermediary thread, these being sometimes totally lacking; spiral lirae 3 on 3rd whorl (? absent on earlier whorls), 4–6 below shoulder on penultimate whorl, 15–19 on base of body whorl, those on rostrum relatively close and slightly weaker than elsewhere.

Colour moderate to light yellowish-brown, nodules, subsutural region and a zone at level of parietal nodule paler; each varix usually followed by an axial blotch of moderate yellowish-brown.

Protoconch worn in all types, but apparently conical, of about 3 convex whorls, of which the last is relatively large, giving protoconch a slightly pupiform appearance; last half-whorl evidently with fine axial riblets; breadth approximately 1,1 mm, height about 1,0–1,2 mm.

Dimensions: 43,7 × 13,1 mm (holotype); 55,8 × 14,9 mm, 42,5 × 11,8 mm (largest and smallest adult paratypes respectively).

Operculum oblanceolate, anterior end acute with terminal nucleus, colour strong to deep yellowish-brown.

Radula (Fig. 42) of about 46 rows of marginal plates; distal end of shaft rather tapering, cutting edge not sharply differentiated, accessory limb slender and very long.

Range: Outer continental shelf and slope of Natal, 195–310 m.

Type material: Holotype NM A1646/T3613, off Umhlanga Rocks (29°43'S, 31°05'E), 164–169 fathoms, R. Cruickshank. Paratype 1, NM B5916/T3636, off Durban, 270 m, fine sand, numerous ophiuroids, solitary corals, dredged *MN*. Paratype 2, NM B5906/T3637, off Durban, 195 m, slightly muddy sand, ophiuroids, solitary corals, dredged *MN*. Paratypes 3–4, NM 9909/T3638, off Durban, 150 fath., trawled G. Scott. Paratypes 5–6, NM B2030/T3639, off Durban, trawled in about 120 fath., B. J. Young. Paratypes 7–10, NM A2140/T3641, off Natal north coast, R. Cruickshank. Paratype 11, NM D1915/T3640, off Natal, trawled, broken shell, radula slide M190, B. Keyter.

Notes: Comparison of local material with the lectotype (here designated, Figs 215–216) of *Inquisitor aesopus* (Schepman, 1913), and with a Philippine example of that (NM K1530), reveals a number of significant differences. From both *I. aesopus* and *I. arctatus (q.v.), I. nodicostatus* differs in its broader shell, stronger subsutural cord (weak in *aesopus*), stronger, rounder and less sloping axial ribs, much stronger, more uniform spiral lirae, forming conspicuous nodules (smaller in *arctatus*, absent in *aesopus*). Furthermore, in *nodicostatus* the intervals between spirals contain few if any intermediary spirals (in *aesopus* 1–2 threads per interval), the parietal tubercle is much longer and more pointed, often projecting beyond outer lip, and the protoconch is more conical, with rounder whorls.

Etymology: *nodus* (a knot or node) + *costatus* (ribbed), L.

**Inquisitor arctatus** sp. n.

Figs 37, 44, 217–218

Diagnosis: Shell moderately large (50 mm), b/l 0,28–0,29, a/l 0,34–0,37, whorls only moderately convex, scarcely shouldered, siphonal canal moderately long, tip obliquely truncate, with very shallow notch; aperture narrow, fasciole sometimes fairly strong, labrum weakly crenulate, stromboid notch slight, anal sinus narrowly U-shaped with parallel sides, parietal nodule fairly large, tongue-shaped, directed adapically, situated at suture; subsutural cord strong, on later whorls slightly narrower than the moderately deep, slightly concave shoulder sulcus; axial ribs thin, almost orthocline, terminating at sulcus, 14–16 on penultimate whorl, bearing small, somewhat rounded nodules where crossed by spiral cords, which in rib intervals are more or less equal to their interstices, 5–6 spirals below sulcus on penultimate whorl, with an occasional intermediary, sulcus with 2–5 fine spiral threads; growth-threads coarse; terminal varix mid-dorsal, an occasional varix on spire. Buff, peripheral zone and subsutural cord orange-brown, shoulder area and rostrum cream. Protoconch narrowly domed, of about $1\frac{1}{2}$ whorls, breadth 0,80–0,85 mm.

Description: Shell narrowly claviform, b/l 0,28–0,29, a/l 0,34–0,37, with narrow aperture and moderately long, fairly narrow rostrum, bent slightly to right and terminating obliquely; $11\frac{1}{2}$ teleoconch whorls; suture moderately deep; whorls moderately convex, barely shouldered, periphery more or less median, shoulder sulcus moderately deep, slightly concave, subsutural cord fairly strong, angular, on later whorls somewhat narrower than sulcus; left side of base of body whorl concave, fasciole sometimes fairly strong, false umbilicus distinct. Aperture as in

*I. nodicostatus* but somewhat narrower, parietal nodule consisting of a thick, tongue-shaped projection, adapically directed above suture, and slightly restricting entrance to anal sinus, which is shaped like a 'U' with parallel sides; siphonal canal not indented terminally.

Sculptured by thin, moderately strong axial ribs, ending abruptly at shoulder, and weaker spiral lirae, which bear small, rounded tubercles where they cross ribs, and even smaller, very inconspicuous and irregular granules where the lirae are crossed by the relatively strong growth-lines; dorsum of body whorl with a strong, rounded varix (situated about one-third whorl back from lip), spire also with an occasional varix. Axial ribs much narrower than their intervals, with rounded crests and gently sloping sides, almost orthocline, almost straight on spire, gently sinuous on body whorl, extending well onto rostrum; subsutural cord with fine axial plicules next to suture; 7–8 ribs on 1st teleoconch whorl, increasing to 14–16 (including varices) on penultimate whorl, becoming weak and irregular after last varix. Spiral lirae relatively low and gently rounded, mostly subequal in width to one another and to their intervals, except for an occasional weaker intermediary and in the shoulder sulcus, which bears 2–5 finer threads; 5–6 lirae below shoulder on penultimate whorl, evidently 3 on 1st whorl; 15–19 main spirals on base of body whorl, where more widely spaced and with more numerous intermediary threads than elsewhere, on rostrum somewhat lower and more angular.

Yellowish-white with a strong to light brown spiral band at level of parietal tubercle, occupying anterior third of each spire whorl; base of body whorl and subsutural region more or less tinged with moderate to dark orange-yellow, basal lirae white; interior of aperture brown-tinged, external brown band also visible; protoconch white.

Protoconch narrowly domed, of $1\frac{1}{2}$ gently convex whorls, 1st one depressed, smooth except for a few weak, terminal axial plicules; breadth 0,80–0,85 mm, height 0,70–0,75 mm (b/h 1,01–1,21).

Dimensions: 39,3 × 11,1 mm (holotype), 49,8 × 13,1 mm (paratype, protoconch missing).

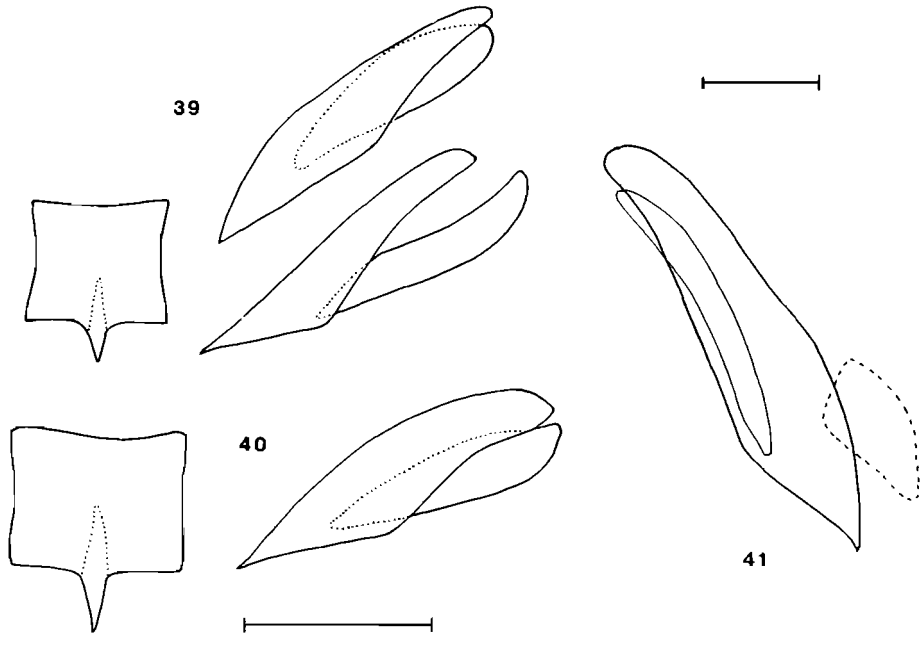
Operculum as in *nodicostatus,* translucent moderate yellowish-brown.

Tentacles small, flattened, eye about $\frac{1}{4}$ length from tip.

Radula (Fig. 44) of about 35 rows of marginal plates, which resemble those of *I. nodicostatus* although they are somewhat shorter.

Range: Outer continental shelf from Zululand to eastern Transkei, 62–115 m.

Type material: Holotype NM D1917/T3611, off Durnford Point, Zululand (approximately 29°06'S, 32°06'E), 110 m, muddy sand, dredged A. Connell. Paratypes 1–2, NM D1574/T3719, same data. Paratypes 3–10, NM D4511/T3720, off Durnford Point, 115 m, dredged A. Connell; paratypes 11–12, NM D4516/T3721, do, 112 m, dredged A. Connell. Paratypes 13–14, NM D3456/T3722, off Umhlanga Rocks, Natal, 34 fath., dredged A. Connell; paratypes 15–16, NM D3464/T3723, do, 40 fath., dredged A. Connell; paratype 17, NM D3458/T3814, do, 37 fath., dredged A. Connell. Paratypes 18–19, NM D3941/T3612, off Durban, 80–85 m, firm, grey muddy sand; dredged *MN.* Paratype 20, NM C751/T3724, off Waterfall Bluff, Transkei, 80–90 m, fine sand, worm-tubes, dredged *MN.*




Figs 39–41. Radulae of some *Turridrupa* and *Crassiclava* species. **39**, *Turridrupa cincta* (Lamarck, 1822); **40**, *T. bijubata* (Reeve, 1843); **41**, *Crassiclava halistrepta* (Bartsch, 1915). Scale-line = 0,05 mm.

Notes: *I. arctatus* is closely allied to *I. aesopus* (Schepman, 1913) but has a slightly stronger subsutural cord, a wider shoulder concavity, poorly-developed interstitial spirals, more coarsely pliculate subsutural region and the spiral lirae bear small rounded nodules (absent in *aesopus*). There is also some resemblance to *Inquisitor philotima* (Melvill & Standen, 1903) from the Persian Gulf; the latter differs in its non-shouldered whorls which lack a distinct subsutural cord.

Etymology: *arctatus* = compressed, L.

**Inquisitor latiriformis** sp. n.
Figs 219–221, 282

Diagnosis: Shell fairly small (16 mm), b/l 0,30–0,33, a/l 0,33–0,36, whorls only moderately convex, scarcely shouldered, siphonal canal moderately short, tip obliquely truncate, with feeble notch; aperture narrow, fasciole usually weak or absent, labrum distinctly crenulate, stromboid notch well-developed, anal sinus narrowly U-shaped with parallel sides, parietal nodule large, pointed, directed outwards, situated at suture; subsutural cord strong to prominent, somewhat undulating, in width equal to/slightly wider than the moderately deep, somewhat declivous shoulder sulcus; axial ribs strong, moderately opisthocline, continuing weakly across sulcus, 8–10 on penultimate whorl, bearing narrow, transverse nodules where crossed by spiral cords, which in rib intervals are much narrower than their interstices, 3 main spirals below sulcus on penultimate whorl, each interval (and sulcus) with 2–4 fine spiral threads; growth-threads pliculate in

places; a single, terminal varix behind lip. Orange- to dark brown, nodules at periphery paler, sometimes greyish-brown with a dark brown apex and base. Protoconch narrowly domed, of about 1½ whorls, breadth 0,75–0,85 mm.

Description: Shell narrowly claviform, b/l 0,30–0,33, a/l 0,33–0,36, with a small, constricted aperture and moderately long, relatively broad rostrum, bent slightly to right and terminating obliquely; 8½ teleoconch whorls; suture moderately deep, somewhat undulating; whorls only moderately convex and barely shouldered, with periphery median or at about basal third, shoulder sulcus moderately deep, somewhat declivous, subsutural cord moderately strong to prominent, angular, somewhat undulating, more or less equalling sulcus in width (sometimes wider); left side of base of body whorl concave, fasciole weak or absent (rarely moderately strong), false umbilicus feeble. Aperture lanceolate, greatest width at about posterior quarter, labrum rather flattened medially, constricted at base of siphonal canal, siphonal canal relatively narrow, expanding terminally and opening slightly to right, very shallowly indented; labial callus moderately thick, its outer edge free, with a large, angular, outwardly projecting parietal tubercle, situated in posterior angle of aperture, and slightly constricting opening of anal sinus; edge of labrum gently convex in side-view, weakly crenulated, with a wide, well-developed stromboid notch, anal sinus deep, narrowly U-shaped, with rather parallel sides, bordered below by a slightly alate angle.

Sculptured by broad, rounded axial ribs, continuing to subsutural cord (although weak to almost obsolete in shoulder sulcus), crossed by relatively thin spiral lirae, which form transversely elongated nodules where they cross; body whorl with a strong, rounded varix less than one-fifth whorl back from lip, spire without varices; growth-lines fine and regular, forming dense, fine plicules in places. Axial ribs much wider than their intervals, with rounded crests and gently sloping sides (the trailing face somewhat steeper than the leading one), moderately opisthocline, straight, evanescing on base of rostrum; 9–10 ribs on 1st whorl, 8–10 on penultimate one. Spiral lirae relatively low and gently rounded; from 2nd whorl, 3 peripheral lirae are stronger than others, expanding on crests of axials to form nodules, and are narrower than their intervals, which bear 2–3 fine spiral threads; shoulder sulcus bears 2–4 thin spiral threads, with or without fine intermediaries; subsutural cord with an angular main lira and 1–2 fine threads below suture; base of body whorl with about 9–14 main lirae, separated by finer intermediaries which vary in number and strength, those on rostrum closer, more angular and becoming progressively finer towards tip of rostrum.

Colour brownish-orange to moderate brown, peripheral nodules pale orange-yellow, rostrum and aperture yellowish-white; one type is pale orange-yellow with intervals between axial ribs brownish-orange, another is light greyish-yellowish-brown, with base of body whorl and apex moderate brown.

Protoconch narrowly domed, of about 1½ gently convex whorls, 1st one depressed, smooth except for a few weak, terminal axial plicules; breadth 0,75–0,85 mm, height 0,70–0,85 mm (b/h 1,00–1,14).

Dimensions: 16,5 × 5,3 mm (holotype), 16,8 × 5,1 mm, 13,7 × 4,4 mm (largest and smallest adult paratypes).

Operculum oblanceolate with acute apex, resembling that of *Funa tayloriana* (fig. 283) but apex curved slightly to the left, translucent yellowish.

Radula (Fig. 282) typical of genus, plates small, approximately 60 rows.

Tentacles as in *I. isabella* (Fig. 33), penis rather club-shaped, without terminal papilla; soft parts dark grey in preservative, which they tint with purple.

Range: Outer continental shelf of southern Zululand, in about 100–115 m.

Type material (all NM): Holotype, D4535/T3527, off Durnford Point (29°05,2'S, 32°08,6'E), 112 m, dredged A. Connell. Paratypes 1–3, D4521/T3528, same data. Paratypes 4–7, D4510/T3529, off Durnford Point, 115 m, dredged A. Connell. Paratype 8, D1525/T3718, do, 110 m, dredged A. Connell. Paratype 9, D4378/T3605, same data. Paratype 10, A258/T3606, off Zululand, *ex pisce*, A. Visage. Paratypes 11–16, 8012/T3940, Durnford Point, 114 m, sandstone rubble, *MN*. Paratypes 17–18, D6633/T3941, off Gobey's Point, Zululand, 55–100 m, sand, shell-rubble, *MN*.

Notes: A distinctively-shaped species, although somewhat variable in colour. Very similar to the Indonesian *Inquisitor subangusta* (Schepman, 1913), but smaller, without the distinctive narrow aperture of that, and differing also in possessing a well-developed subsutural lira on later whorls and axial ribs that extend onto the shoulder slope.

Etymology: *latiriformis* = shaped like a *Latirus*.

**Inquisitor isabella** sp. n

Figs 26, 33, 43, 222–223

Diagnosis: Shell fairly small (21 mm), b/l 0,30–0,33, a/l 0,31–0,36, whorls with a rounded shoulder, siphonal canal moderately short, tip obliquely truncate, with fairly deep notch; aperture narrow, fasciole fairly strong, labrum distinctly crenulate, stromboid notch well-developed, anal sinus openly U-shaped, directed slightly adapically, parietal nodule large, rounded, situated at suture; subsutural cord strong, weakly nodose, equal in width to moderately deep, concave shoulder sulcus; axial ribs strong, moderately opisthocline, terminating at sulcus, 11–12 on penultimate whorl, bearing strong, rounded to transverse nodules where crossed by spiral cords, which in rib intervals are somewhat tabulate and much wider than their interstices, 3–4 spirals below sulcus on penultimate whorl, sulcus with a shallow median furrow only; no intermediary or microspiral threads, growth-threads inconspicuous; 2–3 varices per whorl, terminal one mid-dorsal. Greyish-white with crests of ribs and a median zone paler, spirals tinged with yellowish-brown between ribs, varices followed by an axial orange-brown blotch, subsutural cord spotted with orange-brown. Protoconch rather papilliform, of nearly 2 whorls, breadth 0,73–0,78 mm.

Description: Shell narrowly claviform, b/l 0,30–0,33, a/l 0,31–0,36, with moderately short, obliquely truncate base; suture moderately deep, teleoconch whorls about 10; each whorl moderately convex, periphery more or less median, slightly shouldered with a moderately deep shoulder sulcus (which contains a shallow median groove); subsutural cord moderately strong, angulate, crenate to subnodular, equal in width to sulcus or slightly wider; left side of base of body whorl

concave, fasciole moderately strong. Aperture narrowly pyriform, siphonal canal wide, expanded terminally, end quite deeply notched; labial callus thick, forming a strong, rounded nodule in posterior angle of aperture, not intruding into opening of anal sinus and hence scarcely constricting it, outer edge of callus only slightly free on columella; columella slightly convex, parietal region concave; labrum strongly convex in side-view, crenulated, with a wide, well-developed stromboid notch and deep, openly U-shaped anal sinus, which is directed slightly adapically.

Sculptured by strong axial ribs, crossed by weaker spiral lirae, which form low, rounded to transverse nodules on their crests; 2–3 varices per whorl from 3rd or 4th whorl on, these being strong and wide on later whorls, the last one being mid-dorsal; growth-lines fairly strong, sometimes forming low plicules on spiral ridges, particularly basally. Axial ribs more or less equal to intervals, opisthocline, straight on spire whorls, slightly arcuate on body whorl where they reach rostrum, evanescing abruptly above at mid-shoulder sulcus, crests of ribs angular in cross-section, sides steeply sloping; 8–9 ribs on 1st whorl, 11–12 on penultimate one (including varices), weak and irregular behind lip. Spiral lirae moderately wide and gently rounded (somewhat flatter between axials), with very narrow interstices, creating a sulcate appearance on later whorls; a total of 7–8 thin, close lirae on 1st whorl, 3–4 below shoulder on penultimate whorl, 14–16 on base of body whorl, those on rostrum narrow and rounded.

Colour [greyish-] white, spiral lirae marked between axials with light brown, each varix followed by an axial streak of moderate brown; crests of ribs, base and a median line around body whorl white, subsutural cord spotted with light to moderate brown, apical whorls dark brown; aperture and columella white.

Protoconch (Fig. 26) rather papilliform, of nearly two whorls, 1st one tilted; smooth except for growth-lines on last quarter-whorl; breadth 0,73–0,78 mm, height 0,68–0,80 mm (b/h 0,91–1,11).

Dimensions: 20,3 × 6,4 mm (holotype); 21,0 × 6,5 mm, 18,9 × 5,7 mm (largest and smallest paratype respectively).

Operculum oblanceolate with sharp terminal nucleus, translucent moderate yellow.

Body light yellow, siphon mottled with black, eyes large, tentacles short, only slightly exceeding eye-lobe in length; penis very large, dorsoventrally flattened, its tip conical, without a rectractile papilla, but opening of sperm-duct surrounded by a weak, crenulated flange (Fig. 33).

Radula (Fig. 43) small, of about 48 rows of marginal plates, which resemble those of *I. arctatus*.

Range: Northern Mozambique littoral.

Type material: Holotype NM K587/T3607, south-western shore of Quirimba Island (about 12°26′S, 40°37′E), sheltered *Thalassodendron* flats at LST, R. K. Paratypes 1–5, NM K588/T3614, same data. Paratype 6, NM K586/T3608, apex, operculum, radula (slide M201), same data.

Notes: This species lives shallowly but completely buried in fine sand between the roots of *Thalassodendron* at extreme low tide. When found, most of the types bore small white epizootic hydroids.

*I. isabella* is closely allied to *I. varicosus* (Reeve, 1843) of the Philippines, and has been compared with three syntypes of that species (BM(NH) 1963873) and with a small NM series. In *varicosus* the shoulder is obsolete and the shoulder sulcus contains spiral threads instead of a shallow median groove; axial ribs are at most shallowly incised by the spiral sculpture, instead of being cut into weak nodules as in *isabella;* varices are wider and smoother in *varicosus,* its protoconch is less bulbous and the 1st teleoconch whorl is much flatter.

Etymology: Named in honour of Mrs Isabel de Matos Leitão of Maputo, in appreciation for the hospitality shown to me by her and her husband, Mr João Gomes Leitão, on the expedition during which the types were collected.

*Inquisitor cerithina* (Anton, 1838) **comb. n.**

Figs 280–281

*Pleurotoma cerithina* Anton, 1838: 73. Type locality unknown.
*Turridrupa cerithina*; Powell, 1967: 420 (synonymy), pl. 305, fig. 1, pl. 306; Cernohorsky, 1978a: 151, pl. 54, fig. 4.

Range: Japan and Polynesia to northern Zululand.

Regional locality data: NORTHERN MOZAMBIQUE: Conducia Bay (NM H4532: K. Grosch). ZULULAND: off Kosi Bay, outer edge of coral reef, 1–2 km S. of mouth, 18–24 m (NM D9262: D. G. Herbert); between Bhanga Nek and Kosi Bay, algal reef, 9–10 m (NM D9261: D. G. Herbert).

Notes: Although the type material of Anton's *Pleurotoma cerithina* was never figured, and is now presumably lost, his description is detailed and appears to be explicit. Cernohorsky (1978b) showed that Anton's work must be dated from 1838, not 1839 as has been the practice.

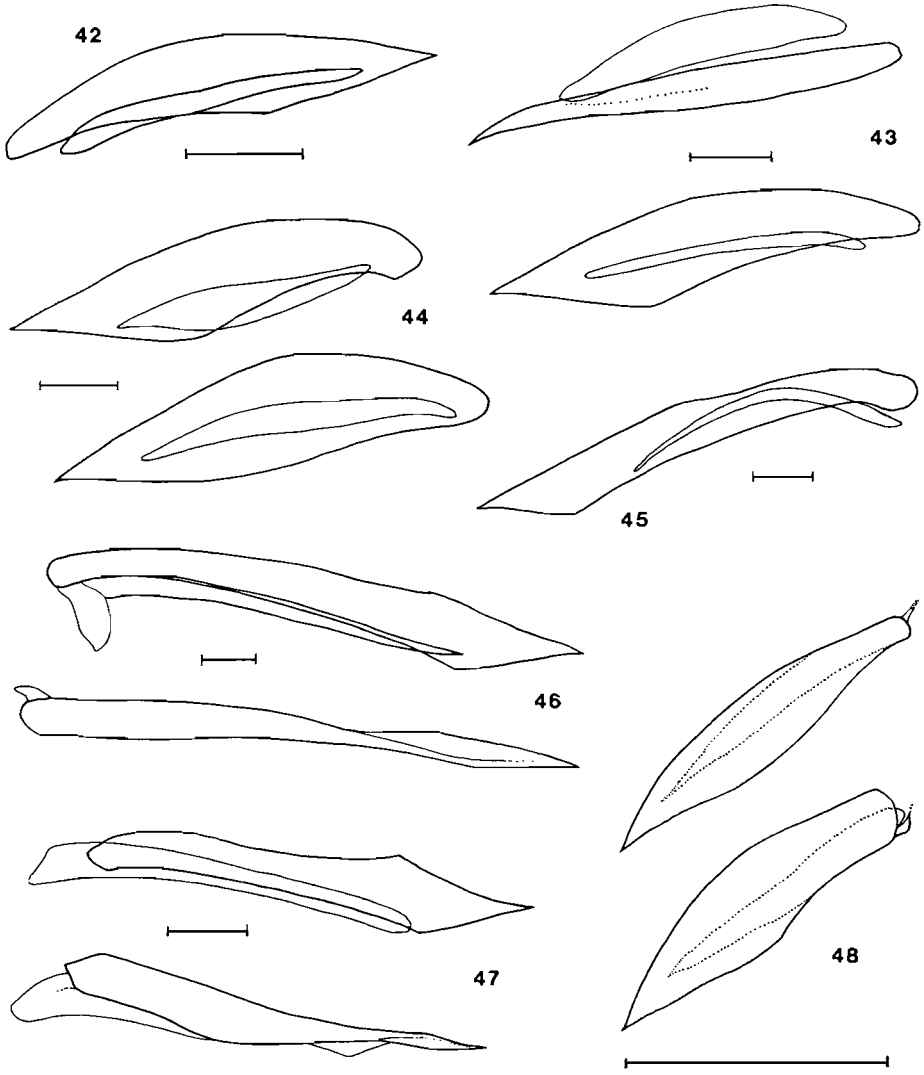
The true generic position of *cerithina* is doubtful, but I am following the suggestion of the late Mrs Virginia O. Maes, based on her examination of the radula, that it is an *Inquisitor.* In shell characters it is not dissimilar to some members of the Western Hemisphere genus *Crassispira.* From the single live-taken example available I was able to extract only the head-foot, and I am unable to figure the radula. The operculum is thick, translucent brownish-orange, and resembles that of *Calcatodrillia chamaeleon* (Fig. 2) in shape. The tentacles and penis are illustrated in Fig. 280. The slightly worn protoconch of a juvenile (Fig. 281) is pupoid-conic, of 2,5 whorls, smooth except for 4 strongly opisthocline, curved terminal ribs, width 0,82 mm (b/h 1,00); 1st teleoconch whorl with 4 equal, rounded spiral ridges and about 7 axial ribs, subequal to the spirals in strength, with shallowly foveolate interstices.

**Funa** gen. n

Type species: *Drillia laterculoides* Barnard, 1958.

Diagnosis: Shell moderately small to fairly large (16–62 mm), claviform with high, acute spire and moderately produced, obliquely truncate base, tip of siphonal canal not or shallowly indented; fasciole weak to well-developed in adult; labrum thin, although with a strong varix preceding it, anal sinus deep, openly U-shaped, sometimes slightly constricted at opening, directed somewhat adapically, occupying

entire shoulder slope, bordered below by a weakly alate expansion of lip; parietal callus forming a small, rounded nodule slightly below end of aperture, generally constricting entrance to anal sinus; subsutural cord weak to absent, shoulder sulcus ill-defined and declivous; axial ribs well-developed, stopping at shoulder; often vividly patterned with brown. Protoconch narrowly domed or conical, 2–4½ whorls, smooth, except sometimes for a few weak axial riblets near termination. Operculum oblanceolate with terminal nucleus. Radula crassispirine, marginal plates with long shaft and flattened distal end with well-defined, double cutting edges; accessory limb long.




Figs 42–48. Radulae of some *Inquisitor, Funa, Calcatodrillia* and *Mauidrillia* species. **42**, *Inquisitor nodicostatus* sp. n.; **43**, *I. isabella* sp. n.; **44**, *I. arctatus* sp. n.; **45**, *Calcatodrillia chamaeleon* sp. n.; **46**, *Funa asra* sp. n.; **47**, *F. laterculoides* (Barnard, 1958); **48**, *Mauidrillia felina* sp. n. Scale-line = 0,05 mm.

Notes: The present genus, although greatly resembling *Inquisitor* (q.v.) in shell-characters, is sharply distinguished by its very different radula teeth. Only three species are undoubtedly referable here, but a third, *fraterculus,* is associated with *Funa* on grounds of general shell resemblance. In known members of the genus the parietal callus does not fill the posterior angle of the aperture as in *Inquisitor,* but forms a discrete knob slightly below it; the upper limb of the anal sinus is also less protractive than in *Inquisitor* (Figs 37–38). The significance (if any) of these characters will only be understood when the radulae of more Indo-Pacific species are known. The radula of *Funa* somewhat resembles that found in *Naudedrillia*; members of the latter genus differ in their lower spire, shorter, broader base, and a parietal pad that is terminal (as in *Inquisitor*).

Etymology: *Funa* = to search, Zulu, gender feminine.

Key to species of *Funa* in southern Africa and Mozambique

1 Subsutural cord absent (on later whorls at least); spiral lirae neither granular nor regularly dotted with brown ..... 2
— Subsutural cord present; spiral lirae usually granular and regularly dotted with brown ..... 3
2 Entire surface with microscopic spiral threads; penultimate whorl with 4–6 main spiral lirae; protoconch conical, of 3½ whorls ..... **laterculoides**
— Secondary spiral threads inconspicuous, visible on shoulder slope and between spiral lirae; penultimate whorl with about 10 main spiral lirae below shoulder; protoconch bluntly conical, of 2 whorls ..... **fraterculus**
3 Shoulder slope with microscopic spiral striae; suture relatively deep; 6–8 main spiral lirae below shoulder on penultimate whorl; exceeds 60 mm in adult length ..... **asra**
— Shoulder slope with 2–4 spiral threads; suture shallow; 8–10 main spiral lirae below shoulder on penultimate whorl; attains 40 mm in length ..... **tayloriana**

*Funa laterculoides* (Barnard, 1958) **comb. n.**

Figs 25, 47, 224–227

*Drillia laterculoides* Barnard, 1958: 129, fig. 12c. Type locality: 'Off Hood Point (East London area), 49 fathoms' [erroneous! Here emended to: off Durban in 150 m.]

Diagnosis: Shell medium-sized (31 mm), b/l 0,30–0,34, a/l 0,34–0,38, whorls with a rounded shoulder, siphonal canal moderately long, tip obliquely truncate, with a shallow to fairly deep notch; aperture fairly narrow, fasciole feeble to absent, labrum weakly crenulate in side-view, stromboid notch well developed, anal sinus openly U-shaped, directed slightly adapically, parietal nodule moderately small, rounded, situated below posterior angle of aperture; no subsutural cord nor distinct shoulder sulcus; axial ribs moderately strong, strongly opisthocline, terminating more or less abruptly at shoulder, 9–12 on penultimate whorl, bearing weak, transverse nodules where crossed by spiral cords, which in rib intervals are weak and narrow, 4–6 spirals below shoulder on penultimate whorl; surface covered in microspiral striae and pliculate growth-threads; a single varix just behind lip.

Mottled light brown, flecked with brownish-orange (particulaly at periphery and below suture), peripheral nodules pale. Protoconch conical, of about 3½ whorls, breadth 0,88–0,93 mm.

Description: Shell claviform (b/l 0,30–0,34, a/l 0,34–0,38), with moderately long, tapering, somewhat obliquely truncate, siphonal rostrum, bent slightly to right, and moderately narrow aperture, suture fairly shallow; teleoconch whorls about 9; whorls convex, periphery median on early whorls, later whorls with periphery about ⅓ whorl below suture, with terminations of axial ribs forming a weak, rounded shoulder; shoulder slope gently concave, without a subsutural cord or distinct sulcus; sides of base of body whorl concave, fasciole usually absent, occasionally weakly developed, with a slight false umbilicus. Aperture narrowly pyriform with greatest width at about posterior third, siphonal canal wide, expanding slightly towards end, its termination very shallowly to moderately deeply notched; labial callus thick, its outer edge slightly free on columella, forming a relatively small, rounded but somewhat laterally compressed parietal nodule just below posterior angle of aperture, and slightly constricting anal sinus; columella almost straight; labrum thin, smooth inside, edge weakly crenulate, angular but scarcely alate at lower border of anal sinus, stromboid notch very slight; anal sinus deep, openly U-shaped, its opening tilted slightly adapically.

Sculptured by moderately strong axial ribs, crossed by relatively weak spiral lirae; entire surface covered by dense, microscopic spiral threads, which are interrupted by dense, raised growth-striae; a single varicoid rib just behind lip. Axial ribs suture-to-suture (and often somewhat continuous) on first 4–5 teleoconch whorls, thereafter weakening below suture, and on last three whorls evanesce fairly abruptly on shoulder slope; on body whorl ribs usually obsolete by parietal level, occasionally continuing onto base; in some examples axial ribs become weak on body whorl, where they are represented by peripheral nodules; ribs strongly opisthocline (less so on early whorls), crests rounded in section, sometimes sharply so, with fairly gently sloping sides; more or less equal to intervals; 8–10 ribs on 1st whorl, 9–12 on penultimate one. Spiral lirae forming 6–7 very weak threads on 1st whorl; on penultimate whorl 4–6 widely-spaced main lirae below shoulder, generally low, but stronger on ribs, where they may form 2–4 small peripheral nodules; on base of body whorl lirae varying so greatly in strength (some lirae being little stronger than the microsculpture) that they cannot be counted.

Colour: light brown, ribs usually spotted with brownish-orange at shoulder and on back of body whorl, suture bordered by a line of dots of that colour; peripheral spirals white where they cross axials; protoconch brownish-orange to white.

Protoconch (Fig. 25) conical, of about 3½ convex, vitreous whorls, first whorl small and tilted, smooth except for a few close, arcuate axial plicules at termination, breadth 0,88–0,93 mm, height 0,95–1,05 mm (b/h 0,89–0,98).

Dimensions: 31,1 × 9,8 mm (largest adult), 21,2 × 6,6 mm (smallest apparent adult).

Operculum oblanceolate, nucleus anterior, sharp, growth-lines coarse; [near] pale orange-yellow, translucent.

Radula (Fig. 47) of about 18 rows of marginals, shaft moderately long.

Range: Outer continental shelf from southern Zululand to eastern Transkei, 50–200 m.

Locality data (all NM: *MN*, unless otherwise stated): ZULULAND: off Durnford Point, 142 m, mud (NM D7819). NATAL: off Umhlanga Rocks, 59 fath. (B6293: A. Connell); off Durban, 65 fath., rubble (B6267: A. Connell), do, 104–110 m, muddy sand, broken shells (D4016), 110–120 m, coarse muddy sand (D3826), do, 130 m, sandstone gravel, some rocks (D4215), do, 150 m, sandstone gravel, some sponge (D4155), do, 165 m, fine muddy sand, asteroids, corals (B5892); off Umlaas Canal, 80 fath. (B6271: A. Connell), do, 200 m, coarse sand (D893), do, 150 m, muddy sand and fine pebbles (D1166) and coarse sand, pebbles, spatangoids (D804), do, 140 m, sand, pebbles (D1133); off Amanzimtoti, 115–125 m, medium sand (D1289). TRANSKEI: off Port Grosvenor, 100–110 m, pebbles, some sand (C615, C7497); do, 100–110 m, coarse sand, some mud, solitary corals (C408 (living), C1180), do, 100–115 m, sand, some mud, solitary corals (C634), do, 105 m, flat rocks, pebbles, mud (C1298), do, 95–100 m, coarse sand (C580); off Mzimhlava River, 50 m, coarse sand (C538); off Mgazi River, 92 m, coarse sand, rubble (C3286), do, 100 m, coarse sand, rubble (C2802, living), do, 190 m, glutinous black mud (C8806, living), do, 140–145 m, glutinous black mud (C9314).

Type material: Two syntypes, one immature (17,4 × 5,5 mm), the other consisting solely of an apex, SAM A8709; the former (Fig. 224) is here designated as lectotype. The given type locality is considerably further south than the established range of the species, and is in fact the *PF* station that I showed (Kilburn 1986) to be mislabelled. The type locality is accordingly emended to 'off Durban, 150 m'.

Notes: *F. laterculoides* is a fairly common species on the Natal shelf, and occurs mainly on substrata of coarse sand and rubble, except at the extreme southern end of its range, where it is found on thick black mud. *F. laterculoides* is somewhat similar to the tropical *Inquisitor* (or more probably *Funa*) *flavidulus* (Lamarck, 1822). Judging by NM examples from Queensland, the Philippines and elsewhere, *flavidulus* attains a much larger size (at least 60 mm), has a slightly larger protoconch (breadth 1,0 mm, instead of 0,9 mm), stronger spiral threads on the shoulder slope, a stronger alate expansion to the lip below the anal sinus, and a siphonal rostrum that is slightly longer and distinctly recurved dorsally. *Inquisitor nudivaricosus* Kuroda & Oyama (1971: 215, pl. 56, fig. 10, pl. 110, fig. 14) of Japan may prove to be a synonym of *laterculoides*.

**Funa fraterculus** sp. n.

Figs 228–229

Diagnosis: Shell fairly small (16,8 mm), b/l 0,33, a/l 0,32–0,35, whorls with a distinct shoulder, siphonal canal moderate, tip somewhat obliquely truncate, with a shallow notch; aperture fairly narrow, fasciole moderate, labrum weakly crenulate in side-view, stromboid notch well developed, anal sinus U-shaped, entrance strongly constricted, directed slightly adapically, parietal nodule weak, rounded, situated below posterior angle of aperture; a weak subsutural cord on first three whorls, shoulder slope concave, but without a distinct sulcus; axial ribs moderately

strong, strongly opisthocline, terminating more or less abruptly at shoulder, 12–14 on penultimate whorl, not nodular; spiral lirae rather fine, low, about 10 below shoulder on penultimate whorl; weak spiral threads on shoulder slope and between spiral lirae, but surface not covered in microspiral striae, growth threads fine but pliculate; a single varix just behind lip. Speckled with light brown on a paler ground, below suture with brownish-orange flecks and an occasional blotch, peripheral lirae pale where cross ribs. Protoconch bluntly conical, of about 2 whorls, breadth 0,85–0,90 mm.

Description: Shell claviform (b/l 0,33 a/l 0,32–0,35), with moderate, somewhat obliquely truncate, siphonal rostrum, bent slightly to right, and moderately narrow aperture, suture shallow; teleoconch whorls about $7\frac{1}{2}$; whorls convex, periphery median on early whorls, later whorls sometimes with periphery about $\frac{1}{3}$ whorl below suture, with terminations of axial ribs forming a moderate shoulder; shoulder slope evenly concave, first 3 whorls with a weak subsutural cord, obsolete thereafter, no distinct sulcus; sides of base of body whorl concave, fasciole moderate, with a slight false umbilicus. Aperture narrowly pyriform with greatest width at about posterior third, siphonal canal wide, expanding slightly towards end, its termination shallowly notched; labial callus fairly thick, its outer edge slightly free on columella, forming a weak, rounded parietal nodule just below posterior angle of aperture, and slightly constricting anal sinus; columella almost straight; labrum thin, smooth inside, edge weakly crenulate, angular but scarcely alate at lower border of anal sinus, stromboid notch very slight; anal sinus deep, U-shaped, with its opening constricted and tilted slightly adapically.

Sculptured by moderately strong axial ribs, crossed by relatively fine spiral lirae, with even finer threads in intervals (where they are somewhat reticulated by fine, raised growth-striae) and on shoulder slope; a single varicoid rib just behind lip. Axial ribs more or less suture-to-suture on first teleoconch whorl, thereafter weakening below suture, and on last two whorls evanesce fairly abruptly on shoulder slope; on body whorl ribs usually obsolete by parietal-columella level, on dorsum continuing to rostrum; ribs strongly opisthocline, crests sharply rounded in section, with moderately sloping sides; more or less equal to intervals; 10–11 ribs on 1st whorl, 11–14 on penultimate one. Spiral lirae forming 6–7 very weak threads on 1st whorl; on penultimate whorl about 11 fine striae on shoulder slope and about 10 main lirae (with inconspicuous, weaker intermediary threads) below shoulder, low, somewhat stronger (but scarcely nodular) on ribs; base of body whorl with about 30 spiral lirae, and an occasional intermediary, those lirae on rostrum rather angular.

Speckled with light yellowish-brown on a paler ground, 3–4 peripheral lirae whitish where they cross ribs, subsutural region flecked with moderate orange, with an occasional blotch of that colour, lip preceded by two spiral bands of white.

Protoconch bluntly conical, of about 2 convex, vitreous whorls, first one small and tilted, smooth, termination ill-defined; breadth 0,85–0,90 mm, height 0,98–1,00 mm (b/h 0,85–0,90).

Dimensions: 16,8 × 5,6 mm (holotype); 16,2 × 5,4 mm (paratype).

Operculum, radula and soft parts unknown.

Range: Southern Mozambique.

Type material: Holotype NM J489/T3610, between Maputo and Zavora, *ex pisce*, C. Fernandes. Paratypes 1–2, NM K1592/T3609, same data.

Notes: Superficially resembling a miniature *Funa laterculoides* (Barnard, 1958), but with a paucispiral protoconch, finer, more numerous spiral lirae, a weak subsutural cord on the early whorls, and a more concave shoulder slope; finer, secondary spiral threads are present in places, but the species lacks the ubiquitous microsculpture of spiral striae that characterises *laterculoides*. Provisionally referred to the genus *Funa* on account of the above similarity in shell-characters.

Etymology: *fraterculus* = a little brother [of *F. laterculoides*], L.

**Funa asra** sp. n.

Figs 32, 38, 46, 235–236

Diagnosis: Shell large (60 mm), b/l 0,31–0,33, a/l 0,37, whorls with a slight shoulder, siphonal canal moderately short, tip oblique but scarcely truncate, with at most a shallow notch; aperture narrow, fasciole sometimes strong; labrum weakly crenulate, stromboid notch well-developed, anal sinus openly U-shaped, directed slightly adapically, parietal nodule relatively small, rounded, situated below posterior angle of aperture; subsutural cord weak and narrow, shoulder sulcus rather shallow and declivous; axial ribs moderately strong, strongly opisthocline, terminating abruptly at shoulder, 11–13 on penultimate whorl, usually bearing weak, transverse nodules where crossed by spiral cords, which in rib intervals are low, flattened and subequal to their intervals, 6–8 spirals below sulcus on penultimate whorl; intervals with microspiral striae (visible mainly on shoulder sulcus) and pliculate growth-threads; a single thick varix just behind lip. Cream or light brown, spiral lirae dotted with darker brown, sometimes with diffuse blotches or zones of brown, peripheral nodules pale. Protoconch bluntly conical, of slightly over 3 whorls, breadth 0,93–0,98 mm.

Description: Shell claviform (b/l 0,31–0,33, a/l 0,37), with moderately short, oblique but scarcely truncate rostrum, bent slightly to right; teleoconch whorls about 11; suture moderately deep; whorls convex with median periphery and slight shoulder; subsutural cord rounded, narrow and weak, bordered by a moderately shallow, declivous sulcus; left side of base of body whorl concave, fasciole sometimes strong, with distinct false umbilicus. Aperture lanceolate, greatest width at about posterior quarter, columella almost straight, siphonal canal moderately wide, parallel-sided, termination shallowly or not indented; labial callus thick, with outer edge free on columella, parietal pad relatively small and rounded, non-terminal (sometimes situated as much as half-way down parietal region); labrum strongly convex in side-view, crenulate, with well-developed stromboid notch; anal sinus deeply and openly U-shaped, inclined slightly adapically, bordered below by a slightly alate angle.

Sculptured by strong axial ribs, crossed by weaker spiral lirae, more or less nodular at intersections, particularly on last part of body whorl; overall with dense,

fine, pliculate growth lines, with microscopic interstitial spiral striae visible in places (particularly in shoulder sulcus); a thick varix behind lip. Axial ribs opisthocline, rather straight, suture-to-suture until 6th whorl, thereafter obsolete on subsutural cord and sulcus, weak on base of body whorl, but reaching rostrum; ribs subequal to their intervals, crests rounded, sides gradually sloping; 9–10 ribs on 1st whorl, 11–13 on penultimate one. Spiral lirae rounded on ribs, somewhat flattened in intervals, main ones equal to their intervals, 1st whorl with a total of 8–9 very weak, close threads; penultimate whorl with 6–8 lirae below sulcus, base of body whorl with 18–20 lirae, at parietal level alternately weaker and stronger, becoming weak, wide-set and more angular on rostrum. Interstitial spiral striae: 2–10 per interval, 3–6 on subsutural cord, 14–24 in sulcus, sometimes absent in places.

Colour yellowish-white to pale orange-yellow, spiral lirae with dots of white and light to moderate brown, sometimes diffusely blotched or spirally zoned with light to moderate brown, axial ribs generally pale in peripheral area and on base of body whorl.

Protoconch bluntly conical, of slightly over 3 whorls, first whorl depressed and slightly immersed; smooth except for faint terminal axials; breadth 0,93–0,98 mm, height 0,88–0,98 mm (b/h 1,00–1,06).

Dimensions: 58,0 × 17,1 mm (holotype); 61,7 × 19,0 mm, 48,2 × 16,0 mm (largest and smallest adult paratypes respectively).

Operculum oblanceolate, with acute apex, translucent yellowish.

Radula (Fig. 46) of about 20 rows of marginal plates, shaft relatively long.

Range: Continental shelf of Natal and Zululand, 85–120 m, sand and sponge.

Type material (all NM): Holotype D3984/T3725, S. E. of Green Point, Natal south coast (30°15,0′S, 30°54,3′E), 100 m, fine sand and rubble, dredged *MN*. Paratype 1, B6312/T3726, off Port Durnford, Zululand, 100 m, A. Connell. Paratype 2, B6304/T3727, do, 120 m, A. Connell. Paratype 3, B6317/T3728, off Umhlanga Rocks, Natal, 47 fath., A. Connell. Paratype 4, B6276/T3729, do, 52 fath., A. Connell. Paratype 5, D3827/T3730, off Durban, 110–120 m, coarse muddy sand, *MN*. Paratype 6, B6288/T3731, do, 57 fath., A. Connell. Paratype 7, B3495/T3732, off Scottburgh, 100 m, A. Connell. Paratype 8, C1567/T3733, off Park Rynie, 100 m, some sand, sponge-rubble, *MN*. Paratype 9, B8901/T3734, off Umzinto, 84 m, *MN*. Paratype 10, D7575/T3936, off Gobey's Point, Zululand, 120–150 m, sandstone rubble, glass sponges, *MN*.

Notes: *F. asra* resembles *F. tayloriana* (Reeve, 1846) in the fine growth-plicules and speckled, more or less granular spiral lirae, but is a much larger species with more convex whorls and more oblique axial ribs, while the shoulder slope has microscopic spiral striae rather than 2–4 threads. It resembles *Inquisitor flavidulus* (Lamarck, 1822) in many respects, but that has distinct microcancellate sculpture, and a relatively feeble subsutural cord.

Etymology: Named after the motor-launch *Asra*, owned by Mr Derek Watts, from which Dr A. Connell first dredged this and several other important new discoveries.

*Funa tayloriana* (Reeve, 1846) **comb. n.**

Figs 230–234, 283–284

*Pleurotoma tayloriana* Reeve, 1846: pl. 40, fig. 366a, b. Type locality unknown.
*Inquisitor taylorianus*; Hedley, 1922: 246 (references).
*Drillia variabilis* (*non* E. A. Smith, 1877); Barnard, 1958: 127.

Diagnosis: Shell medium-sized (36 mm) b/l 0,31–0,33, a/l 0,31–0,34, whorls with a slight shoulder, siphonal canal rather short, end moderately obliquely truncate, with a rather deep notch; aperture relatively wide, fasciole moderately developed; labrum crenulate, stromboid notch shallow but distinct, anal sinus openly U-shaped, directed slightly adapically, parietal nodule relatively small, rounded, situated below posterior angle of aperture; subsutural cord weak and narrow, shoulder sulcus rather shallow and declivous; axial ribs strong, moderately opisthocline, terminating on shoulder slope, 9–12 on penultimate whorl, crossed by thin, weakly granular spiral cords, which in rib intervals are low, rounded and equal to/slightly narrower than their intervals, 8–10 spirals below sulcus on penultimate whorl, each interval usually with a finer intermediary thread and pliculate growth-lines, but no microspiral striae; a single thick varix just behind lip. Cream or light brown, spiral lirae dotted with orange-brown, shoulder region usually with an occasional blotch of deep brown. Protoconch conical, of about 2½ whorls, breadth 0,90 mm.

Description: Shell narrowly claviform (b/l 0,31–0,33, a/l 0,31–0,34), with moderately wide aperture and rather short, moderately obliquely truncate base; teleoconch whorls about 11, suture shallow, whorls anteriorly convex with median, slightly shouldered periphery, shoulder slope shallow and declivous to slightly concave, narrow, subsutural cord rather weak; left side of base of body whorl concave, with fairly strong fasciole, false umbilicus slight. Aperture narrowly pyriform, greatest width posterior to median, siphonal canal fairly broad, more or less parallel-sided, termination rather deeply notched; columella fairly straight, parietal region concave, labial callus thick, its outer edge slightly raised, parietal pad relatively small, rounded, laterally compressed, not terminal, but slightly constricting anal sinus in adult; labrum strongly convex in side-view, crenulated, stromboid notch slight; anal sinus deep, openly U-shaped, slightly adapically directed, bordered below by a slightly alate angle.

Sculptured by strong axial ribs, crossed by thin, weakly granular spiral lirae, which do not as ā rule form distinct nodules on ribs; growth-lines fine and regular, forming plicules in interstices; labrum preceded by a strong varix. Axial ribs suture-to-suture on first four whorls, thereafter rather peripheral and node-like, evanescing on shoulder sulcus, sometimes reaching as far as rostrum on base of body whorl, crests rounded in section, with gently sloping sides, opisthocline, rather straight, equal to/slightly narrower than intervals; 6–8 on first whorl, 9–12 on penultimate whorl. Spiral lirae narrow, rounded, subequal to intervals, except on base where they are narrower, each interval generally with a thin intermediary thread; about 5 spiral lirae on 1st whorl; on penultimate whorl 8–10 below shoulder, 2–4 fine lirae in shoulder sulcus [apparently absent in holotype], and two feeble threads on subsutural cord; base of body whorl with 17–22 lirae, alternately weaker and stronger on upper part of base.

Ground colour yellowish-white to [near] light orange, patterned with light, moderate or strong brown, in the form of regular dots on spiral lirae, irregular spots on subsutural lirae, and scattered blotches, sometimes strong, sometimes diffuse, in shoulder region.

Protoconch conical of about 2½ whorls, 1st whorl small and depressed, vitreous, smooth except for three somewhat distant, arcuate, axial ribs near termination; breadth 0,90 mm, height 1,00 mm (b/h 0,90).

Dimensions: 39,8 × 12,7 mm; 31,0 × 10,2 mm.

Operculum (Fig. 283) oblanceolate with a sharp apex, translucent yellow.

Radula (Fig. 284) as in *laterculoides*; about 22 rows.

Tentacles as in *F. asra* but tip longer; penis very long and slender, evidently without a terminal papilla.

Range: Philippines and India to Natal.

Regional locality data (all NM, unless otherwise stated): NORTHERN MOZAMBIQUE: Quisiva Island, Quirimba Archipelago, dead on reef-flats (K322: R. K.). ZULULAND: S. E. of Kosi Bay, 50 m, fine to coarse sand, shell rubble, large algae (D6217, D8410, D8344, D6953, D8297, D7302: *MN*); same locality, 45–47 m, red algae, sponges (D6290: *MN*); same locality, 45–50 m, fine sand, algae, gorgonians (D8873: *MN*); off Kosi Bay, 45 m, fine muddy sand (D6001: *MN*); off Boteler Point, 70 m, coarse sand, shell gravel (D7389: *MN*); off Dog Point, sandstone conglomerate, marine growths (D7078: *MN*); off Island Rock, 50 m, fine sand, pennatulids (D7223: *MN*); off Hully Point, 60 m, shell-rubble (D6714: *MN*); off Gobey's Point, 44–66 m, sand, shell-rubble (D7165: *MN*); do, 55–60 m, sand, shell-rubble (D7178: *MN*); off Jesser Point, 65–70 m, fine sand (D8598); off Ledsman Shoal, 100 m, dead (NM B3550: A. Connell); off Cape Vidal, 22 fath. (SAM A1737: *PF*). NATAL: off Umkomaas, 50 m, fine sand, dead (NM D3718: *MN*).

Type material: Holotype (Figs 230–231) BM(NH) 1879.2.26.26, ex Lombe-Taylor colln.; an immature shell, 36,5 × 11,6 mm, evidently polished with acid.

Notes: Local shells agree with the faded holotype of *F. tayloriana* and lack the spiral microsculpture that is characteristic of the interstices in *Inquisitor* (or more probably, *Funa*) *variabilis* (Smith, 1877) and of the entire surface in *F. laterculoides* (Barnard, 1958). The faded shell on which Barnard (1958) based his record of *'Drillia' variabilis* is a typical *tayloriana*. Nevertheless, true *variabilis* may prove to occur on the coral coast of northern Mozambique, as a bleached shell from Conducia Bay (NM G3113: K. Grosch) has distinct interstitial spirals similar to that of the holotype (BM(NH) 1985160, Figs 237–238) and of NM examples from India and Queensland. *F. tayloriana* replaces *F. laterculoides* in northern Zululand, where it is an abundant species in fine to coarse sand in 45–70 m; it inhabits shallower water than *F. asra*.

## **Naudedrillia** gen. n.

Type species: *Naudedrillia nealyoungi* sp. n.

Diagnosis: Shell small to moderate-sized (5–30 mm), claviform with short, obliquely truncate siphonal canal, whorls usually shouldered, without a distinct

subsutural cord or sulcus, sculptured by short axial ribs (obsolete above shoulder), crossed by fine spiral striae; labrum evenly curved below a moderate to deep U-shaped anal sinus, which is usually constricted at its opening, but may be linear, parietal callus elongate; siphonal canal shallowly indented dorsally; labrum sometimes preceded by a weak to massive varix. Protoconch of $1\frac{3}{4}$–2 whorls, smooth except sometimes for coarse growth-lines and faint spiral striae on last half-whorl. Operculum as in *Crassispira.* Radula crassispirine, of marginal plates only, shaped like long-handled scalpels, sometimes with a double cutting edge; accessory limb long. Penis with small terminal papilla.

Notes: In radula characters there is some resemblance between members of *Naudedrillia* and the Western Atlantic genus *Inodrillia* Bartsch, 1915. Radulae of several species of *Inodrillia* were figured by Powell (1966: text figs E109–111), and the shells of most (including protoconchs) by Kaicher (1984). In *Inodrillia* the outer lip is conspicuously 'pinched-in' near its base (not evenly curved as in *Naudedrillia*) and the later whorls of the protoconch bear conspicuous axial ribs. From *Inquisitor* and *Funa,* members of this genus differ in their lower spire and shorter, broader base; absence of a subsutural cord and shape of the marginal plates further distinguish *Naudedrillia* from *Inquisitor.*

The group is a difficult one and several species are not easy to distinguish. The commonest and most widely spread species, *Naudedrillia praetermissa* (Smith, 1904), is the most variable. In its typical form it sometimes washes up on the shore (the only member of the genus to do so). This form is replaced on the continental shelf and slope by two more or less strongly varicoid bathymorphs (probably an adaptation against higher predation by the molluscivorous crabs which abound on sand and sponge bottoms). The remaining species of *Naudedrillia* are described here for the first time. Of these, *N. nealyoungi* is one of the most distinctive, on account of its relatively large size, subcylindrical body whorl, deep, somewhat slot-like anal sinus and distinct false umbilicus, and is the only species known from the Durban area, to which it appears to be restricted. Further south, on the southern Natal shelf, it is replaced by *N. cerea,* which is distinguished by its waxy appearance and by the tumid subsutural region, the shoulder itself being undeveloped. (However, there is some indication that *nealyoungi* and *cerea* may intergrade, and a subspecific relationship is not impossible). Even further south, in deeper Transkei waters, occurs the somewhat similar *N. angulata,* which lacks the swollen sutural margin but has an angular shoulder. Somewhat to the west of this, ranging at least as far as East London, occurs *N. filosa,* whose shell has a gentler profile than the others, the shoulder being weak and the fasciole absent; it has fine, dense but well-developed spiral threads that convey a high gloss to the surface. Occurring together with *filosa* on sponge-bottoms off Transkei, although ranging into deeper water, is the distinctive *N. mitromorpha,* which in some respects resembles a miniature *filosa,* but has a more ovate shape and aperture, a feeble or non-existent parietal pad, and a shallow anal sinus, as well as differing in sculptural details. Finally there is the puzzling *N. perardua,* from sponge-bottoms on the Natal-Transkei shelf, in which is combined to some extent the shape of *praetermissa,* the colour pattern of *nealyoungi* and the spiral sculpture of *filosa*! Nevertheless the type series of

*perardua* shows considerable uniformity, which together with geographical considerations, renders it scarcely likely that we are dealing with true intermediates.

Etymology: Named after the *R/V Meiring Naude.*

Key to species of *Naudedrillia*

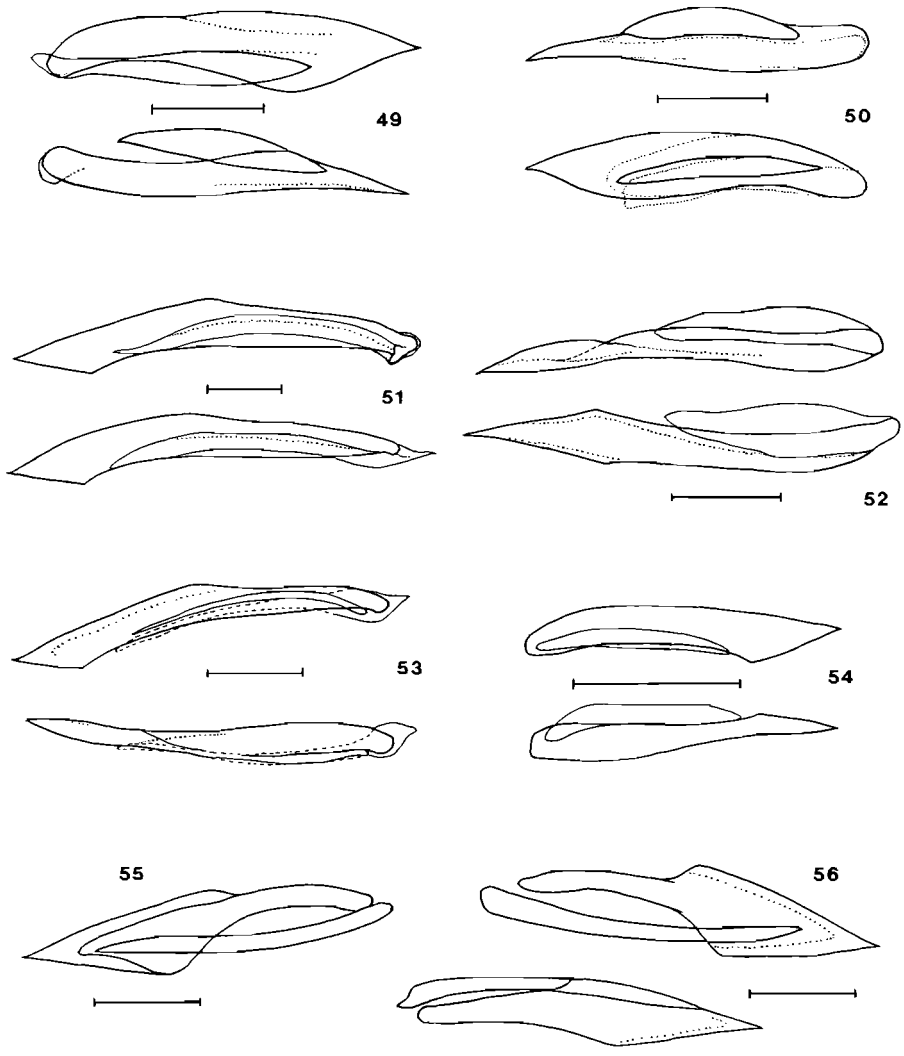
1 Small (up to 5,5 mm), protoconch width 0,80–0,85 mm; anal sinus shallow, parietal nodule feeble or absent ..... **mitromorpha**
— Adult exceeding 10 mm in length, protoconch width 0,95 mm or more; anal sinus deep, parietal nodule distinct to strong ..... 2
2 Subsutural region slightly swollen, whorls not shouldered ..... **cerea**
— Subsutural region not swollen, shoulder weak to strong ..... 3
3 Spiral lirae conspicuous, although little stronger than growth-lines, which render intervals minutely pliculate, 13–28 lirae crossing axials on penultimate whorl ..... 4
— Spiral lirae inconspicuous, much stronger than growth-lines, 6–18 crossing axials; intervals not pliculate ..... 5
4 Fasciole present; 13–23 spiral lirae below top of shoulder on penultimate whorl; axial rib strong, continuing to back of lip ..... **perardua**
— Fasciole absent; 21–28 spiral lirae; axial ribs feeble ..... **filosa**
5 Anal sinus somewhat slot-like; no projecting peripheral lirae; labrum rather straight, without varix ..... **nealyoungi**
— Anal sinus U-shaped, periphery often with 1–3 projecting threads; labrum arched, preceded in adult by a weak to massive varix ..... 6
6 Colour variable, but not as below; axial ribs continuing strongly to behind lip; aperture narrower, labrum with crenulate edge and weakly alate projection below anal sinus; protoconch diameter 0,95–1,18 mm, its 1st whorl somewhat flattened ..... **praetermissa**
— Pale biscuit-colour with a row of brown blotches above mid-body whorl and a row of brown subsutural flecks; axial ribs weak behind labrum; aperture wider, edge of labrum neither crenulate nor alate; protoconch diameter 1,25–1,33 mm, 1st whorl rounded ..... **angulata**

*Naudedrillia praetermissa* (E. A. Smith, 1904) **comb. n.**

Figs 3, 20, 52, 244–255

*Drillia praetermissa* E. A. Smith, 1904*a*: 27, pl. 2, fig. 4; Turton 1932: 20, pl. 4, no 158. Type locality: Port Alfred.
*Austrodrillia praetermissa*; Kilburn & Rippey, 1982: 117.
*Drillia lara* Bartsch, 1915: 22, pl. 2, fig. 4; Turton, 1932: 20. Type locality: Port Alfred.
*Drillia zenobia* Turton, 1932: 20, pl. 4, no 159. Type locality: Port Alfred.
*Drillia caffra* (*partim non* Smith, 1882): Barnard, 1958: 124.

Diagnosis: Shell with b/l 0,31–0,43, a/l 0,34–0,44, whorls weakly to moderately strongly shouldered, not swollen below suture, fasciole moderately strong, without a distinct false umbilicus; edge of lip gently crenulate, anal sinus fairly deep, U-shaped, sometimes with a constricted opening, stromboid notch shallow; aperture oblong-ovate, labrum somewhat patulous at base; prelabral varix varying




Figs 49–56. Radulae of some *Nquma*, *Naudedrillia* and *Haedropleura* species. **49**, *Nquma rousi* (Sowerby, 1886); **50**, *N. scalpta* sp. n.; **51**, *Naudedrillia filosa* sp. n.; **52**, *N. praetermissa* (Smith, 1904); **53**, *N. nealyoungi* sp. n.; **54**, *N. mitromorpha* sp. n.; **55**, *Haedropleura summa* sp. n.; **56**, *H. ima* (Bartsch, 1915). Scale-line = 0,05 mm.

from absent to very thick; axial ribs relatively strong, 10–20 on penultimate whorl; spiral threads weak, 6–18 crossing axials on penultimate whorl, 1–3 in peripheral region usually stronger and forming pale granules on ribs; growth-lines much weaker than spirals, not rendering the intervals minutely pliculate; colour light or orange-brown with inconspicuous spiral lines of darker and lighter flecks; sometimes yellow or orange, with or without a pale subsutural region. Attains 23,9 mm. Protoconch breadth 0,95–1,18 mm, 1st whorl somewhat flat-topped; no spiral striae.

Description: Shell claviform (b/l 0,31–0,43, a/l 0,34–0,44), spire more or less orthoconic, apex scarcely papilliform, rarely decollated, siphonal canal short, tapering, obliquely truncate; suture shallow, not undulating, teleoconch whorls about $6\frac{1}{2}$; whorls with slight to moderately strong shoulder, actual periphery more or less median, subsutural region evenly concave, without cord or sulcus; left side of base of body whorl concave with moderate fasciole, false umbilicus absent or forming a slight groove. Aperture oblong, greatest width just behind middle, labrum slightly patulous basally, incurved above, siphonal canal wide, more or less parallel-sided, slightly indented dorsally; labial callus moderately thick, its edge not free except sometimes slightly so on columella, parietal pad compressed, extending along outer edge of callus and continuous with labral termination, constricting opening of anal sinus in adult; labrum moderately convex in side-view, with thin, slightly incurved, gently crenulated edge, stromboid notch well-developed, anal sinus fairly deep, U-shaped, directed slightly adapically, lower margin weakly alate.

Sculptured by weak to strong axial ribs (occasionally feeble and irregular on later whorls) and fine (sometimes feeble) spiral threads; ribs in peripheral region usually with 1–3 rows of pale granules; growth-lines coarse and regular, incising spirals and rendering intervals finely pliculate; labrum preceded by a strong to massive varix in sublittoral adults. Axial ribs ending abruptly at shoulder, usually weak above suture and evanescing at parietal level, but continuing to behind lip on body whorl, opisthocline, slightly arcuate, equal to/slightly narrower than intervals, crests weakly angular, with gradually sloping sides, 9–13 ribs on 1st whorl, 10–20 on penultimate one. Spiral lirae low, varying in width, sometimes alternately weaker and stronger, usually 1–3 lirae in peripheral area coarser than elsewhere, forming transverse granules on ribs; 1st whorl with 7–9 lirae, penultimate one with 6–18 crossing axials plus 3–7 very feeble lirae (often obsolete) in shoulder concavity itself, base of body whorl with 25–33 well-spaced spirals.

Ground colour variable: light/brownish-orange, moderate/strong orange-yellow or (most commonly) light/moderate yellowish-brown or light brown; spiral lirae generally with darker and lighter flecks, shoulder slope usually with irregular blotches or flames of brown, body whorl often with a diffuse brown median zone, peripheral granules (when present) yellowish-white; protoconch white to light brown with darker median zone.

Protoconch (Fig. 20) rather flat-topped, about $1\frac{3}{4}$ whorls, initial one small; smooth except for growth-plicules on last whorl; breadth 0,95–1,18 mm, height 0,73–1,08 mm (b/h 1,05–1,48).

Dimensions: 23,9 × 7,9 mm, 12,6 × 4,9 mm (largest and smallest specimen respectively).

Operculum (Fig. 3) lanceolate, acute anteriorly, nucleus terminal, translucent strong yellow.

Marginal plates of radula (Fig. 52) with moderately long, double cutting edges; accessory limb diaphanous, rather broad.

Tentacles as in *Funa asra*; foot white, flecked with black, ctenidium black.

Range: Continental shelf and upper slope from Tsitsikamma coast to southern Natal in 20–300 m, shells washing up littorally.

Locality data (all NM): *(a)* Typical form: TSITSIKAMMA COAST: Mossel Bay (6687: H. C. Burnup). EASTERN CAPE: Algoa Bay (6689: H. C. Burnup); Port Alfred (B2979: H. Becker; B747: E. K. Jordan; 6816: W. H. Turton, as *D. lara*); 6691: R. K.); East London (617: M. Lavertine; 2726: H. Burnup; A2833: Mrs. C. M. Connolly); off Nahoon, 85 m, medium sand (B7837: *MN*); Kwelera (A2836: Mrs. C. M. Connolly). TRANSKEI: Dwesa (C5993: R. K.); off Mendu Point, 66 m, coarse sand and rubble (A4785: *MN*); Xora (B4095, 5940: R. K.); off Whale Rock, 20–26 m, sand, gorgonians (C3226: *MN*); Lwandile/Mdumbi area (C9630: R. K.); Coffee Bay (B6815: W. Tyson).

*(b)* Bathymorph I (all *MN*): TRANSKEI: off Mzamba, 100 m, sponge-rubble (C2566); off Port Grosvenor, 80–81 m, calcareous nodules (C931); off Port Grosvenor, 82 m, worn calcareous nodules (C671); off Ubombo, 96 m, sand and gravel (C7182); off Mgazi, 100 m, coarse sand and rubble (C3284); off Rame Head, 75–80 m, old shell conglomerate, worn shells (C2944); off Bulungula, 90 m, slightly muddy sand (C2511); off Nthlonyane, 90–95 m, lithothamnion pebbles (C2624); off Nthlonyane, 80 m, sand, broken shell (C2575); off Nqabara Point, sponge and sand (C4154); off Qora River, 100 m, coarse sand, some sponge-rubble (C4836); off Stony Point, 95 m, sponge-rubble (C4209); off Sandy Point, 90 m, calcareous debris, coarse sand (C4502); off Sandy Point, 94 m, gorgonians, sponges (C9632); do, 90 m, calcareous debris, coarse sand (C9633). EASTERN CAPE; off East London, 90 m, coarse sand, sponges, gorgonians (B7821).

*(c)* Bathymorph II (all *MN*): NATAL: off Park Rynie, 136 m, sponge-rubble (B3881); off Port Edward, 120–125 m, living (D1376); do, 140 m, living (D1397). TRANSKEI: off Mzamba, 100 m, sponge-rubble (C5266); off Whale Rock, 150–200 m, sponge-rubble (C2829); off Bulungula, 250–300 m, coarse sand (C9439); off Nthlonyane, 240 m, sponge-rubble (C3304); off Mendu Point, 300 m, coarse sand (C6563); do, 250 m, coarse sand, rubble, few sponges (C6395); off Shixini Point, 140–150 m, stylasterids, sponge-rubble (C4464); do, 240 m, sponge-rubble, stones (C6302); off Stony Point, 192 m, rocks (C4382); off Qolora, 174 m, sponge-rubble (C4634).

Type material: Types of *Drillia praetermissa* in BM(NH). Holotype of *D. lara* is USNM 187001 (*fide* Bartsch 1915). Two syntypes of *D. zenobia* in OUM, one in NM (6703/T2787, ex Albany Mus., don. Turton); the larger OUM shell, a damaged specimen of 13,0 mm length, is designated lectotype. Of the three examined syntypes of *zenobia*, two (including the lectotype) represent the *lara* form of *N. praetermissa*. The third (in OUM) may possibly be a worn *Tylotiella herberti*, but its condition is too poor for certainty, and the locality would be extralimital to the known range of that. None of these syntypes is the figured example, and Turton's photograph is so badly retouched that one can only speculate that it was based on a somewhat atypical example of the variable *praetermissa*.

Notes: Three morphs of *N. praetermissa* are here recognised. The typical inshore form, with undeveloped prelabral varix, not infrequently washes up on beaches from Mossel Bay to western Transkei. It is the most variable in shape and colour, and individuals with rounded whorls and orange or zonate colouration (*lara* Bartsch, 1915) may appear very different (Fig. 247) to typical shouldered, light

brown ones (Figs 244–246). Deep-water forms (which also occur off southern Natal) have a more or less strongly developed subterminal varix when adult, and somewhat more numerous axial ribs (13–20 on penultimate whorl instead of 10–15). At depths of over 100 m occurs a form here called 'bathymorph II' (Figs 252–255), which is characteristic of the outer shelf and slope. This differs from varicoid individuals (Figs 248–251) living at a lesser depth on the shelf ('bathymorph I') in its stronger axial ribs and more massive varix; in addition, size tends to be smaller in bathymorph II, and decollation of the apex sometimes occurs.

**Naudedrillia filosa** sp. n.

Figs 51, 239–240

Diagnosis: Shell with b/l 0,35–0,39, a/l 0,35–0,37, whorls relatively weakly shouldered, not distinctly swollen below suture; fasciole and false umbilicus absent; labrum not crenulate, stromboid notch weak, anal sinus and aperture as in *praetermissa,* but aperture wider at siphonal canal; no prelabral varix; axial ribs relatively weak, 14–17 on penultimate whorl; spiral threads fine but slightly rounded and relatively conspicuous, 21–28 crossing axials on penultimate whorl, none projecting at periphery, their intervals rendered minutely pliculate by growth-lines which equal the spiral threads in strength; pale reddish- or yellowish-brown with inconspicuous spiral lines of brown dots/dashes and an occasional brown blotch below suture. Attains 14,7 mm. Protoconch as in *nealyoungi;* faint spiral striae near termination, breadth 1,15–1,20 mm.

Description: Shell claviform (breadth/length 0,35–0,39, a/l 0,35–0,37), spire slightly cyrtoconic, apex not papilliform, siphonal canal moderately short, tapering slightly to right, squarely to slightly obliquely truncate, not curved; suture shallow, not undulating; teleoconch whorls about 5; whorls relatively weakly shouldered, convex, periphery at or slightly above median, subsutural region not swollen but sometimes with a feeble indication of a bordering ridge, shoulder slope weakly concave to almost flat, left side of base concave without a distinct fasciole or false umbilicus. Aperture oblong, medium third almost parallel-sided, siphonal canal wide, slightly curved to left, termination feebly indented dorsally; labial callus moderately thick on columella, outer edge not free, thin in parietal region except for a relatively small, oblong pad that is continuous with labrum and barely constricts anal sinus; labral edge thin, non-crenulate, stromboid notch shallow but distinct, anal sinus moderately deep, U-shaped, directed very slightly adapically, its lower border weakly alate.

Surface somewhat silky; sculptured by weak to feeble axial ribs, crossed by dense spiral threads, growth-lines pliculate, sometimes equal in strength to spirals; no varix. Axial ribs form low, gently rounded swellings on shoulder, but become obsolete below periphery and on shoulder slope, opisthocline; ribs only develop from 2nd whorl, 14–17 on penultimate whorl. Spiral lirae dense and thread-like, more or less equal in strength except on shoulder slope where they are thinner; 1st whorl with 7–8 lirae, penultimate whorl with 21–28 crossing axials, plus 7–8 in subsutural region; base of body whorl with 33–40 lirae.

Protoconch as in *N. nealyoungi* but pale or light orange-yellow and last quarter-whorl with growth-lines and very faint spiral striae; breadth 1,15–1,20 mm, height 1,05–1,10 mm (b/h 1,07–1,21).

Colour light brown to light yellowish-brown, apex and base paler, with spiral lines of elongated brown dots, subsutural region blotched with moderate brown and sometimes pale orange-yellow, shoulder sometimes with an occasional pale blotch. Colour pattern sometimes very faint.

Dimensions: 14,5 × 5,6 mm (holotype); 14,7 × 5,7 mm and 13,1 × 5,1 mm (largest and smallest paratypes respectively).

Operculum as in *N. praetermissa,* translucent yellow.

Radula (Fig. 51) of about 23 rows of teeth; marginals somewhat arched, ventral cutting edge short, dorsal one equal to half length of plate, accessory limb long and slender.

Tentacles rather lobate with large eyes; penis of immature male long, compressed, linear, tip rounded with small terminal papilla.

Range: Continental shelf of western Transkei to off East London, 90–95 m.

Type material: Holotype NM B8239/T3530, off East London (33°04,7'S, 28°07,2'E), 90 m, coarse sand, sponges, gorgonians. Paratype 1, NM D2312/T3531, same data; paratype 2 (in alcohol), NM B7821/T3532, same data. Paratypes 3, NM C9634/T3533, radula slide M295, off Sandy Point, Transkei, 90 m, calcareous debris, coarse sand. Paratype 4, NM C9625/T3534, off Stony Point, Transkei, 95 m, sponge rubble. All dredged *MN.*

Notes: The dense spiral threads render the surface of the shell somewhat 'silky', in contrast to the 'waxy' appearance of *N. cerea* and *N. angulata,* and the rather matt surface of *N. nealyoungi.* Somewhat similar to the last-named species, but relatively broader with a wider aperture and markedly more tapering base, without a distinct fasciole, anal sinus broader and less slot-like, siphonal canal more shallowly indented.

Etymology: filosus = with threads, L.

**Naudedrillia perardua** sp. n.

Figs 241–243

Diagnosis: Shell with b/l 0,36–0,41, a/l 0,31–0,38, whorls with moderately strong shoulder, subsutural region not swollen, fasciole weak to moderate, without a distinct false umbilicus, aperture as in *praetermissa*; prelabral varix weak; axial ribs relatively strong, 15–21 on penultimate whorl; spiral sculpture as in *filosa,* but 13–23 threads crossing axials on penultimate whorl, growth-lines nearly as strong as spirals, rendering the intervals minutely pliculate; pale to orange-brown, with numerous spiral lines of darker brown dots/dashes and darker brown subsutural blotches. Attains 17,3 mm. Protoconch as in *nealyoungi,* faint spiral grooves near termination, breadth 1,05–1,25 mm.

Description: Shell claviform, b/l 0,36–0,41, a/l 0,31–0,38, spire more or less orthoconic, apex not papilliform; siphonal canal moderately long, relatively broad, somewhat obliquely truncate; suture shallow, not undulating; teleoconch whorls

about 5½; whorls moderately strongly shouldered, periphery at about midwhorl, subsutural region not swollen, although a spiral thread at suture may be accentuated; shoulder slope gently concave; left side of base of body whorl concave, fasciole weak to moderately swollen, without a false umbilicus. Aperture oblong, not patulous basally, siphonal canal short, oblique, its termination weakly indented dorsally; labial callus thick, its outer edge more or less free on columella in adults; parietal pad as in *cerea*; labral edge thin, slightly incurved, evidently smooth, anal sinus deep, U-shaped, constricted at opening, directed slightly adapically.

Sculpture of low axial ribs crossed by dense, relatively conspicuous spiral threads; growth-lines finer than spirals, rendering them somewhat crispate and the interstices minutely pliculate, an occasional growth-line (particularly on early whorls) very coarse; prelabral varix relatively weak. Axial ribs evanesce above shoulder and on body whorl below parietal level, opisthocline, straight, equal to/slightly narrower than their intervals, crests bluntly angular with gradually sloping sides; ribs usually very feeble on 1st whorl, 13–20 on 2nd, 15–21 on penultimate whorl, continuing to lip on back of body whorl. Spiral lirae fine but sharply incised, varying in width but mostly equal to their intervals, peripheral lirae not more conspicuous than elsewhere; 1st whorl with a total of 7–9 weak lirae, penultimate whorl with 13–23 crossing axials, plus 28–31 lirae of irregular strength on body whorl.

Colour light yellowish-brown to pale orange-yellow with well-spaced spiral lines (4–7 on penultimate whorl) of strong brown dots, with blotches of strong brown below suture; one example is pale with conspicuous blotches of deep yellowish-brown on shoulder slope and a median band of that colour on body whorl; another is uniform pale yellow.

Protoconch as in *N. cerea*; breadth 1,05–1,25 mm, height 1,08–1,15 mm (b/h 1,09–1,28).

Dimensions: 13,5 × 4,9 mm (holotype); 17,3 × 6,4 mm, 11,2 × 4,6 mm (largest and smallest paratypes).

Radula and operculum unknown.

Range: Continental shelf of Transkei and southern Natal, 94–128 m, mostly on sponge bottoms.

Type material (all dredged *MN*): Holotype NM B9026/T3738, off Mbizane River, Natal south coast (30°58,1'S, 30°25,6'E), 100 m, coarse sand, some sponge. Paratypes 1–2, NM C5367/T3552, between Mpahlana and Umyameni Rivers, eastern Transkei, 100 m, sponge rubble. Paratype 3, NM C9516/T3553, off Mbashe River, western Transkei, 100 m, sponges. Paratype 4, NM C4826/T3554, off Qora River, western Transkei, 100 m, coarse sand, some sponge-rubble. Paratype 5, NM C9626/T3555, off Stony Point, western Transkei, 95 m, sponge-rubble. Paratype 6, NM C4031/T3739, off Sandy Point, western Transkei, 94 m, gorgonians, sponges. Paratype 7, NM C1184/T3556, off Port Grosvenor, eastern Transkei, 120–128 m, coarse sand, some mud, solitary corals, shells.

Notes: As its name implies, *N. perardua* is a puzzling taxon in that it seems to combine characters of several of its congeners, *viz*: the shape of *praetermissa,* the

spiral sculpture of *filosa* and the colour pattern of *nealyoungi*. Nevertheless the type series shows a considerable degree of uniformity and it appears highly unlikely that we are dealing with actual intermediates.

Etymology: *perarduus* = difficult or troublesome (L).

**Naudedrillia angulata** sp. n.

Figs 256–257

Diagnosis: Shell with b/l 0,35–0,37, a/l 0,37–0,38, whorls with moderately strong but sloping shoulder, not swollen below suture; fasciole moderate to strong, no distinct false umbilicus; edge of labrum not crenulate, stromboid notch indistinct, anal sinus and aperture as in *praetermissa*, but aperture somewhat wider; prelabral varix weak; axial ribs relatively strong, 14–16 on penultimate whorl; spiral threads and growth-lines as in *praetermissa*, 15–17 spirals crossing axial ribs on penultimate whorl; pale biscuit-colour with a row of small brown blotches above mid-body whorl and subsutural flecks of brown. Attains 26,4 mm. Protoconch as in *nealyoungi*, faint spiral grooves near termination, breadth 1,25–1,33 mm.

Description: Shell claviform (b/l 0,35–0,37, a/l 0,37–0,38), spire more or less orthoconic, apex not papilliform, siphonal canal moderately long, tapering, obliquely truncate, curved slightly to right, suture shallow, not undulating; teleoconch whorls about 6; whorls somewhat angular, forming a moderate but sloping shoulder, periphery at or above midwhorl, subsutural region not swollen nor forming a cord, shoulder slope evenly concave; left side of base of body whorl concave, fasciole moderate to strong, without false umbilicus. Aperture oblong-ovate, sometimes slightly patulous anteriorly, siphonal canal short, wide, oblique, termination feebly indented dorsally; labial callus thick, its outer edge not free, parietal pad weak to strong, forming an elongate nodule continuous with outer lip and constricting entrance to anal sinus; labral edge thin, slightly incurved, smooth, stromboid notch obsolete, anal sinus deep, U-shaped, directed slightly adapically.

Sculpture of weak axial ribs crossed by dense but relatively inconspicuous spiral lirae; growth-lines fine but distinct, practically as strong as spiral lirae; pre-labral varix present but weak. Axial ribs obsolete above shoulder and on body whorl at level of parietal pad, becoming feeble on back of body whorl towards lip, straight, opisthocline, more or less equal to intervals, their crests sharply rounded with gradually sloping sides; 10–12 weak ribs on 1st whorl, 14–16 on penultimate whorl. Spiral lirae thin and low, variable in width, but mostly narrower than their intervals, some about periphery stronger and paler where they cross the ribs than elsewhere; 1st whorl with 7–9 weak threads, penultimate whorl with 15–17 lirae crossing ribs, shoulder slope and subsutural region with 4–9 thin, widely spaced, sometimes feeble, spiral threads; base of body whorl with 24–30 lirae (41 in the largest paratype).

Colour [slightly pinker than] light yellowish-brown, with an interrupted band of strong brown around middle of body whorl and inconspicuous flecks of that colour below suture and on basal lirae; protoconch usually light brown.

Protoconch as in *N. cerea*, about two whorls, termination indistinct, breadth 1,25–1,33 mm, height 1,30–1,53 mm (b/h 0,87–1,02).

Dimensions: 18,2 × 6,4 mm (holotype); 17,1 × 6,3 mm and length 26,4 mm (lip broken), smallest and largest paratype.

Operculum and radula unknown.

Range: Outer continental shelf and upper slope of Transkei, in about 150–270 m.

Type material: Holotype, NM C2304/T3549, off Whale Rock (32°01,7′S, 29°18,2′E), 150–165 m, coarse sand, discoid corals. Paratypes 1–3, NM C9638/T3550, same data. Paratype 4, NM C2115/T3551, off Bulungula River mouth, 250–270 m, muddy sand, old shell debris. All dredged *MN*.

Notes: *N. angulata* is very similar to *N. cerea* but the whorls are angular medially, the subsutural region is not tumid, the ribs are straighter, growth-lines approach spiral lirae in strength, and colour pattern differs; in the peripheral region the crests of the axials show a few pale, somewhat projecting spiral lirae, as in *N. praetermissa*.

**Naudedrillia cerea** sp. n.

Figs 258–259

Diagnosis: Shell with b/l ca. 0,35–0,37, a/l 0,38–0,40, whorls not shouldered, but slightly swollen below suture; fasciole strongly developed, without a distinct false umbilicus; labrum not crenulate, stromboid notch weak, anal sinus and aperture as in *praetermissa*; prelabral varix absent; axial ribs relatively strong, 15–17 on penultimate whorl; spiral threads and growth-lines as in *praetermissa*, 14–18 threads crossing axials on penultimate whorl, peripheral lirae not projecting; pale biscuit-colour flecked overall with brown. Attains 21,5 mm. Protoconch as in *nealyoungi*, faint spiral grooves near termination, breadth 1,18–1,30 mm.

Description: Shell claviform (b/l ca. 0,35–0,37, a/l 0,38–0,40) with slightly cyrtoconic spire, apex not papilliform, siphonal canal moderately long, tapering, obliquely truncate, curved slightly to right, suture shallow, not undulating; teleoconch whorls 6; whorls not shouldered, convex, with median periphery, subsutural region slightly swollen (although not forming a cord) and rising fairly high up previous whorl, followed by a shallow, slight concavity; left side of base concave, with a strong fasciole but no distinct false umbilicus. Aperture oblong with anterior two-thirds almost parallel-sided, slightly incurved, siphonal canal short and wide, its termination shallowly indented dorsally; labial callus thick, its edge slightly free on columella, parietal pad thick, narrow, elongated along callus border to meet labral edge, constricting entrance to anal sinus; labral edge thin, not crenulate, stromboid notch slight, anal sinus deep, U-shaped, directed outward, its lower margin slightly alate.

Surface slightly glossy; sculptured by low axial rib and dense relatively weak, spiral threads; growth-lines fine and mostly inconspicuous; no distinct prelabral varix. Axial ribs terminating gradually at subsutural concavity and on base of body whorl at level of parietal/columella junction, and becoming weak behind lip, opisthocline, slightly arcuate, subequal to their intervals, crests strongly rounded, with gently sloping sides; 10–11 ribs on 1st whorl (sometimes very weak), 15–17 on penultimate whorl. Spiral lirae of variable width (intermediaries developing by splitting of main lirae), low (but stronger than growth-lines) and flattened, with

narrow, incised intervals, 14–18 lirae crossing axials on penultimate whorl, another 10–14 very fine threads on shoulder slope and subsutural region; base of body whorl with 31–41 lirae, rounder but often irregular on rostrum; ca. 6–8 very weak spiral threads on 1st whorl.

Ground colour pale orange-yellow, flecked with brown, particularly below suture and above middle of body whorl, ribs with pale flecks in peripheral region, protoconch light brown; one individual almost uniform yellowish-white.

Protoconch somewhat conical, of $1\frac{3}{4}$–2 whorls, 1st whorl small and initially slightly mammillate; smooth except for coarse growth-lines and faint spiral grooves near termination; breadth 1,18–1,30 mm, height 0,93–1,18 mm (b/h 1,09–1,29).

Dimensions: 19,1 × 6,8 mm (holotype); largest paratype 21,5 × 7,5 mm, smallest 14,2 × 5,3 mm. Outer lip chipped in all specimens.

Operculum and radula unknown.

Range: Continental shelf of southern Natal, 96–140 m.

Type material: Holotype NM B3594/T3544, off Park Rynie (approximately 30°23′S, 30°50′E), 110–130 m, eroded shell—conglomerate. Paratypes 1–3, NM B3924/T3547, off Park Rynie, 120 m, sponge-rubble, solitary corals. Paratypes 4–5, NM B3749/T3546, off Park Rynie, 100 m, sand, sponge-rubble, juveniles. Paratype 6, NM C1641/T3545, off Park Rynie, 140 m, sand, sponge. Paratype 7, NM B8564/T3548, off Park Rynie, 96 m, sponges. All dredged *MN*.

Notes: The non-shouldered whorls and slightly swollen subsutural region give this species a shape that is distinctive within the genus. However, it may prove to intergrade geographically with *nealyoungi*.

Etymology: *cereus* = waxy (L).

**Naudedrillia nealyoungi** sp. n.

Figs 19, 53, 260–261

Diagnosis: Shell relatively large with subcylindrical body whorl and narrow, almost parallel-sided aperture; b/l 0,30–0,33, a/l 0,33–0,39; whorls with moderately strong shoulder, not swollen below suture; fasciole strongly swollen, with false umbilicus; labrum not crenulate, stromboid notch shallow, anal sinus deeper than in *praetermissa* and somewhat parallel-sided; no prelabral varix; axial ribs mostly restricted to low swellings at shoulder, about 14–16 on penultimate whorl; spiral threads flattened and close, 14–17 crossing axial ribs on penultimate whorl; growth-lines coarse; colour yellowish-brown with spiral lines of brown dots or dashes, usually blotched with brown below shoulder. Attains 30,7 mm. Protoconch with 1st whorl rounded, faint spiral striae sometimes present, breadth 1,25–1,35 mm.

Description: Shell narrowly claviform (b/l 0,30–0,33, a/l 0,33–0,39), spire more or less orthoconic, apex not papilliform, siphonal canal moderately long, gradually tapering, obliquely truncate; suture shallow, not undulating, teleoconch whorls 7; whorls moderately strongly shouldered, subsutural region evenly concave, without cord or sulcus, left side of base of body whorl concave, with a strong fasciole and a distinct false umbilicus. Aperture oblong, almost parallel-sided, labrum not patulous below, only slightly incurved, siphonal canal wide, more or less parallel-

sided, its end more strongly indented dorsally than in its congeners; labial callus thick, its outer edge free on columella, parietal pad compressed, sometimes weak, extending along outer edge of callus, and continuous with labral termination; edge of labrum thin, not crenulate, stromboid notch shallow, anal sinus relatively deep, narrow and typically linearly U-shaped, sometimes somewhat openly U-shaped, directed slightly adapically, its lower border not alate.

Sculptured by feeble axial ribs and fine spiral threads; no peripheral granules nor lip varix; growth-lines coarse and irregular, incising spirals. Axial ribs feeble on 1st whorl, elsewhere restricted to barely raised, gently rounded swellings at shoulder, 14–16 on penultimate whorl, but generally irregular and impossible to count with exactitude. Spiral lirae low, flattened, with sharply incised intervals, sometimes weak and irregular, wider than or subequal to their intervals, often alternately weaker and stronger; about 5–8 very weak threads on 1st whorl, penultimate whorl with 14–17 spirals below shoulder, up to 12 on shoulder slope (although sometimes obsolete); base of body whorl with 30–40 spirals, those on rostrum more close-set.

Colour light to moderate yellowish-brown, with spiral lines of darker brown dots/dashes, shoulder slope usually with a series of brown blotches, suture bordered below by a row of brown flecks; protoconch deep or greyish-brown, aperture and columella usually brown-tinged.

Protoconch (Fig. 19) somewhat conical, of 2 whorls, 1st whorl small and initially somewhat mammillate; smooth except for coarse growth-lines (and sometimes faint spiral striae) on last half-whorl; breadth 1,25–1,35 mm, height 1,15–1,60 mm (b/h 0,83–1,09).

Dimensions: 26,9 × 8,1 mm (holotype); largest paratype 30,7 × 10,0 mm, smallest paratype 23,2 mm in length (lip broken).

Operculum and tentacles as in *N. praetermissa.*

Radula (Fig. 53) of about 27 rows of teeth, marginals resemble those of *N. filosa.*

Range: Continental shelf of Natal, 100–150 m.

Type material: Holotype NM D822/T3736, S of Umlaas Canal (30°01,1′S, 31°03,2′E), 150 m, coarse sand, pebbles, numerous spatangoids; dredged *MN.* Paratype 1, NM B6283/T3537, off Umlaas Canal, 70 fath., coarse rubble, dredged A. Connell. Paratype 2, NM D4386/T3536, off Umlaas Canal, 150 m, coarse sand, numerous spatangoids, pebbles, dredged *MN.* Paratypes 3–4, NM D1095/T3535, off Umlaas Canal, 100 m, muddy sand, dredged *MN.* Paratypes 5–8, NM D4228/T3539, off Durban, 130 m, sandstone gravel, some rocks, dredged *MN.* Paratypes 9–10, NM B6295/T3538, off Umhlanga Rocks, 59 fath., dredged A. Connell.

Notes: This is the northernmost member of the genus yet known. It is typically very distinctive, and differs widely from its nearest relative (geographically speaking) *N. cerea,* in whorl profile, general shape, and weaker axial ribs. However, some specimens show variations from the norm that are highly suggestive of *cerea.* When their distributions and variation patterns are better known, it is likely that *cerea* will prove to be a southern subspecies of *nealyoungi.*

Etymology: Honouring Mr Neal Young of the Natal Museum, whose skill and enthusiasm as part of our dredging-team have contributed so much to the success of the project.

**Naudedrillia mitromorpha** sp. n.

Figs 54, 262–264

Diagnosis: Shell small and ovate-fusiform, with b/l 0,43–0,51, a/l 0,41–0,45, whorls not shouldered or only feebly so, not distinctly swollen below suture; fasciole weak; parietal pad feeble or absent; labrum not crenulate, anal sinus relatively shallow, openly U-shaped, stromboid notch shallow, aperture oblong-ovate; prelabral varix broad and low; axial ribs moderately strong and rounded to barely developed, 10–13 on penultimate whorl; spiral threads fine but slightly rounded and relatively conspicuous, 11–14 in total on penultimate whorl, none projecting at periphery, their intervals rendered pliculate by growth-lines which equal the spiral threads in strength; cream-coloured with a median zone of orange-brown, base of body whorl flamed with that colour, subsutural region with flecks or a diffuse band of orange-brown. Attains 5,5 mm. Protoconch domed, breadth 0,80–0,88 mm.

Description: Shell small, ovate-claviform (breadth/length 0,43–0,51, a/l 0,41–0,45), aperture relatively large, spire more or less orthoconic, apex blunt, slightly papilliform, siphonal canal moderately short, tapering slightly to right, squarely to slightly obliquely truncate, not curved; suture shallow, not undulating; teleoconch whorls about 3½; whorls not shouldered or only feebly so, convex, periphery at or slightly below median, subsutural region not swollen but sometimes with a feeble indication of a bordering ridge, shoulder slope weakly concave to almost flat, left side of base concave with a weak fasciole, no false umbilicus. Aperture oblong-ovate, labrum strongly and evenly arched, siphonal canal wide, slightly curved to left, termination not indented dorsally; labial callus rather thin, its outer edge not free, parietal pad feeble or absent; labrum gently convex in side-view, its edge thin, non-crenulate, stromboid notch shallow but distinct, anal sinus shallow, asymmetrically and openly U-shaped, directed very slightly abapically, its lower border not alate.

Surface slightly silky; sculptured by moderately strong to feeble axial ribs (sometimes barely developed), crossed by fine, dense spiral threads, growth-lines pliculate, sometimes equal in strength to spirals and forming weak granules at intersections; varix broad and low, preceding lip. Axial ribs (when developed) low, gently rounded, evanescing on shoulder slope and on base at parietal level, opisthocline, subequal to intervals; ribs only develop from 2nd whorl, 10–13 on penultimate whorl. Spiral lirae dense and even, but shallowly incised; 1st whorl with 7–10 lirae, penultimate whorl with 11–14 in total; base of body whorl with 20–28 lirae.

Protoconch domed, of about 2 whorls, 1st whorl depressed; smooth, except for growth-lines near the sharply defined lip; breadth 0,80–0,88 mm, height 0,55–0,68 mm (b/h 1,22–1,55).

Colour orange-brown with a peripheral band of yellowish-white, or yellowish-white with the median third of body whorl brownish-orange (this just shows on base of spire whorls), colour breaking up on base of body whorl into a series of blotches; subsutural region with brownish-orange flecks, sometimes with a diffuse zone of that colour.

Dimensions: 4,9 × 2,1 mm (holotype); 5,5 × 2,5 mm, 4,9 × 2,2 mm (largest and smallest paratypes).

Operculum flimsy, transparent yellowish, apex sharp.

Radula (Fig. 54) tiny, marginal plates slightly arched, with a single short cutting edge, accessory limb long and slender.

Tentacles simple, almost subcylindrical except for slight swelling near tip, where are situated large black eyes.

Range: Outer continental shelf of Transkei, on sponge-bottoms in 94–230 m.

Type material: Holotype NM C7210/T3562, off Whale Rock (32°01,3'S, 29°19,3'E), 150–200 m, sponge-rubble. Paratype 1, NM C7459/T3569, off Mtamvuna river, 111 m, sponges. Paratype 2, NM C9881/T3563, same data as holotype. Paratypes 3–4, NM C7550/T3564, off Nthlonyane, 220–230 m, sponges, gorgonians. Paratype 5, NM C7537/T3568, off Nthlonyane, 95 m, sponge-rubble. Paratypes 6–7, NM C7470/T3565, off Mbashe River, 200–220 m, sponge-rubble. Paratype 8, NM C4829/T3566, off Qora River, 100 m, coarse sand, some sponge-rubble. Paratypes 9–12, NM C9574/T3567, off Sandy Point, 94 m, gorgonians, sponges. All dredged *MN*.

Notes: This species varies somewhat in colour pattern, development of axial ribs and breadth. Although resembling *N. filosa* in some details, it is unique within the genus on account of its small size, shallow anal sinus and poorly developed parietal nodule, and it may eventually prove justifiable to separate *mitromorpha* into its own subgenus or even genus.

Etymology: Resembling a member of the borsoniine genus *Mitromorpha*.

### **Calcatodrillia** gen. n

Type species: *C. chamaeleon* sp. n.

Diagnosis: Shell medium-sized (15–22 mm), somewhat bucciniform, with relatively large aperture, base square-set, fasciole feeble or absent, no false umbilicus; anal sinus shallow to moderate, symmetrically U-shaped, not spout-like nor constricted by the moderately large parietal nodule, stromboid notch weak; subsutural cord feeble; sculptured by axial ribs (which may reach suture), surface overlaid by a chalky intritacalx, forming fine spiral threads. Protoconch narrowly domed, of about 2 convex whorls, smooth except for terminal axial riblets. Operculum oblanceolate, with terminal nucleus. Tentacles short and lobate, eyes large, snout forming two well-developed lobes; penis broad, flattened, sperm duct opening via a terminal depression. Radula crassispirine, of rather slender, curved marginal plates, with long shaft, blade with twin cutting edges, accessory limb long and slender; basement membrane flimsy.

Notes: The present genus is proposed for two very similar Atlantic Cape species, *C. chamaeleon* and *C. hololeukos*. It appears to be unique among crassispirine genera in the superficial chalky film of microscopic spiral threads which covers the surface of unworn shells. There appears to be some resemblance to the monotypic *Tahudrillia* Powell, 1942, which differs in lacking a parietal pad and (reportedly) spiral striae. As its type species is described from the Eocene of New Zealand I am loath to suggest an affinity. *Calcatodrillia* further differs from *Crassispira* and

*Inquisitor* in lacking a varicoid rib behind the lip, and in the relatively large aperture which gives the shell a somewhat bucciniform appearance.

Judging from descriptions and figures, *Drillia (Drillia) valida* McLean & Poorman, 1971, from Baja California, may prove to be congeneric.

Key to species of *Calcatodrillia*

Shell brown (beneath intritacalx); axial ribs terminating at shoulder, but strong on back of body whorl; left side of base of body whorl concave; a/l 0,38–0,42, anal sinus as deep as wide ..... **chamaeleon**
Shell white; axial ribs extending to suture, but weak on back of body whorl; left side of base of body whorl not concave; aperture smaller (a/l 0,36–0,38), anal sinus shallower than wide. ..... **hololeukos**

Etymology: *calcatus* (lime-washed) + *drillia* (stem name for many claviform turrids), L., f.

**Calcatodrillia chamaeleon** sp. n.

Figs 2, 23, 34, 45, 267–268

Diagnosis: Shell b/l 0,39–0,42, a/l 0,38–0,42), whorls moderately shouldered, left side of base of body whorl concave, with slight fasciole; anal sinus approximately as deep as wide; axial ribs terminating at shoulder, 13–15 on penultimate whorl; protoconch with strongly reversed-sigmoid lip, breadth about 1,2–1,4 mm; dark reddish-brown under greyish intritacalx, aperture violaceous-brown to pale violaceous; maximum length 22,9 mm.

Description: Shell somewhat bucciniform (b/l 0,39–0,42) with large aperture (a/l 0,38–0,42) and body whorl, spire narrowly conical, teleoconch whorls 5½, initially weakly convex, last three whorls strongly so, with periphery forming a moderate shoulder at or just above mid-whorl; shoulder slope shallowly concave with only a slight indication of a subsutural cord; left side of base concave with a slight fasciole and no false umbilicus. Aperture oblong-elliptical, greatest width median or just anterior; siphonal canal broad, shallow and short, its termination level, shallowly indented dorsally; labial callus thick, microscopically granulose, its outer edge slightly free on columella, in parietal region forming a moderately large pad, which does not constrict anal sinus; labrum evenly curved, in side-view rather straight with a slight stromboid notch and moderately deep (depth more or less equal to width), symmetrically U-shaped anal sinus, whose apex is situated on lower shoulder slope.

Sculptured by moderately strong axial ribs, coarse growth-lines and an intritacalx of dense, fine spiral threads. Axial ribs evanescing above shoulder, strongly opisthocline, straight, sharply rounded in transverse section, with equal intervals, on body whorl becoming obsolete at or just below parietal level, continuing to back of lip, although sometimes there restricted to shoulder region; first 1–2 whorls with approximately 13 weak, irregular ribs, penultimate whorl with 13–15, body whorl with 14–16. Spiral threads rendered somewhat granular by growth-lines; about 14 on 1st whorl, 50–60 on penultimate one, continuing on base to rostrum but impossible to count; threads finest and most irregular below shoulder.

Uniform greyish-reddish brown when wet or without intritacalx; when dry, dull brownish-pink with darker ribs; when beach-worn strong brown to brownish-orange; aperture greyish-reddish-brown to greyish-pink, columella tinged with moderate brown.

Protoconch (Fig. 23) worn in all types, but narrowly domed, of approximately two rounded whorls, termination prosocline and strongly reversed-sigmoid, preceded by a few axial riblets; dimensions approximate: breadth 1,2–1,4 mm, height 1,5–1,6 mm (b/h 0,80–0,93).

Dimensions: 17,7 × 7,5 mm (holotype); 22,9 × 9,1 mm, 17,6 × 7,2 mm (largest and smallest adult paratype).

Head, penis (Fig. 34) and operculum (Fig. 2) as described under genus.

Radula (Fig. 45) of about 23 rows of marginal plates.

Range: Atlantic coast of Cape Peninsula, littoral.

Type material: Holotype NM D3503/T3522, off Llandudno (34°00'S, 18°21'E), 30–35 m, dived W. Liltved. Paratype 1, NM D3502/T3523, radula slide M209, same data. Paratypes 2–5, NM D3505/T3524, same data. Paratypes 6–7, NM D3504/T3525, bodies in alcohol, same data. Paratype 8, NM A4607/T3526, Sea Point, Cape Town, beach drift, Mrs M. de Lanoy Meijer.

Notes: The intritacalx is easily eroded so that spiral sculpture is lost. Beach shells are evidently very rare.

Etymology: *chamaeleon* = a chamaeleon (L.), a fanciful allusion to the colour changes that take place according to condition of the shell.

**Calcatodrillia hololeukos** sp. n.

Figs 22, 265–266

Diagnosis: Shell b/l 0,36–0,41, a/l 0,36–0,38, whorls not shouldered or only weakly so, left side of base of body whorl not concave, without a fasciole; anal sinus markedly wider than deep; axial ribs reaching suture, where arcuately curved, 11–14 on penultimate whorl; protoconch lip moderately reversed-sigmoid, breadth 1,40–1,55 mm; uniform white; maximum length 19,1 mm.

Description: Shell as in *C. chamaeleon,* b/l 0,36–0,41, a/l 0,36–0,38, but whorls weakly or not shouldered, left side of base not concave, fasciole absent. Apertural region as in *chamaeleon* but anal sinus shallower (width markedly greater than depth).

Sculptured by moderately strong axial ribs, coarse growth-lines and dense, fine intritacalx threads. Axial ribs reaching suture, strongly opisthocline, rather straight, except below suture where arcuately reflexed, in section sharply rounded, equal to or broader than intervals, on body whorl obsolete at or below parietal level and becoming more or less weak on last quarter body whorl; generally about 12 ribs on 1st whorl (sometimes fine and irregular), 11–14 on penultimate whorl and 14–16 on body whorl. Spiral sculpture as in *chamaeleon.* Colour dull white, inside and out.

Protoconch (Fig. 22) as in *C. chamaeleon,* smooth except for terminal axial riblets, lip moderately reversed-sigmoid; breadth 1,40–1,55 mm, height 1,60–1,75 mm (b/h 0,85–0,94).

Dimensions: 18,8 × 6,7 mm (holotype); 19,1 × 7,3 mm, 15,2 × 6,2 mm (largest and smallest paratypes).

Range: Atlantic coast of Cape Peninsula, littoral.

Type material: Holotype NM D3506/T3542, off Llandudno (34°00'S, 18°21'E), 30–45 m; dived W. R. Liltved. Paratypes 1–3, NM D3507/T3543, same data.

Notes: Although apparently sympatric with *C. chamaeleon,* none of the types were living. The two species are distinguished by a number of characteristics, listed in the key and diagnoses. In addition, the intritacalx appears to be more persistent in *hololeukos* and the protoconch less subject to erosion. The present species also appears to be narrower as an adult (b/l 0,36–0,38, against 0,39–0,42 in *chamaeleon*), although immature shells show overlap.

Etymology: *holos* (all) + *leukos* (white), G.

## *Haedropleura* Monterosato, 1883

*Haedropleura* Monterosato in Bucquoy, Dautzenberg & Dollfus, 1883: 85. Type species (o.d.) *Pleurotoma septangularis* Montagu, 1803.

Diagnosis: Shell small (10–14 mm), narrowly claviform with high spire, base somewhat gradually tapering, truncate, not oblique, siphonal canal short, not notched; labrum preceded by a varix, anal sinus broad, gently concave and relatively shallow, sometimes barely developed, parietal nodule small or absent; axial ribs strong, suture-to-suture, crossed by fine spiral striae; no subsutural cord or groove. Protoconch more or less mammillated, of 2½–4 whorls, the first one small, smooth except for a few brephic axials. Operculum oblanceolate with terminal nucleus. Radula of marginal plates only, shaft slender and relatively short, blade broadly triangular with double cutting edge, accessory limb strong and nearly as long as marginal itself. Tentacles short with eyes on large basal lobes; sperm duct opening into a pit at tip of penis.

Notes: *Haedropleura* has been synonymised by several authors with *Bellaspira* Conrad, 1868. However, the radula of the type species *Haedropleura septangularis*, as figured by Thiele (1929: text-fig. 443) and E. H. Smith (1967a: text-fig 13G), is crassispirine, whereas that of *Bellaspira* is drilliine (McLean & Poorman 1970). The radula of *Haedropleura* similarly demonstrates that the genus does not belong to the subfamily Mangeliinae, as proposed by Glibert (1954: 48) on shell-characters, despite close resemblances in this regard to mangeliine genera such as *Anacithara* Hedley, 1922. Bernasconi & Robba (1984) in fact noted only minor differences between the latter genus (whose radula incidentally is still undescribed) and *Haedropleura*. Whereas *Haedropleura dora* Thiele, 1925 is correctly placed, *H. thea* Thiele, 1925, also from the Agulhas Bank, is here regarded as mangeliine (as is *H. laeta* Thiele, 1925 [= *Pleurotoma (Mangilia) pellyi* Smith, 1882], from the northern Indian Ocean).

Bernasconi & Robba (1984: 277) drew attention to discrepancies in published descriptions of the protoconch of *H. septangularis* and gave a description of that of the holotype. Similarly, unresolved differences exist in descriptions of the anterior part of the gut of *H. septangularis* as given by E. H. Smith (1967a) and by Sheridan

*et al.* (1973). The reproductive system was described by E. H. Smith (1967a) and by Sheridan *et al.* (1973). The reproductive system was described by E. H. Smith (1967b).

In general teleoconch characters, in their radula and in protoconch details, the two South African species treated here agree very well with those of *H. septangularis* of Europe and West Africa. The marginal plates (figs 55–56) are distinctive in shape within the Turridae, and may be compared to a hand-trowel, with a strong supporting limb.

Key to *Haedropleura* species in southern Africa

Axial ribs 13–17 on penultimate whorl, spire relatively high (a/l 0,32–0,36) **summa**

Axial ribs 8–10 on penultimate whorl, spire relatively low (a/l 0,37–0,47) . **ima**

*Haedropleura ima* (Bartsch, 1915) comb. n.

Figs 56, 269–272

*Cythara ima* Bartsch, 1915: 31, pl. 3, fig. 1; Turton, 1932: 30; Barnard, 1958: 150. Type locality: Simon's Bay, False Bay.

*Haedropleura dora* Thiele, 1925: 195 (229), pl. 37 (25), fig. 22. (*syn. n.*). Type locality: off Algoa Bay (33°50,5'S, 25°48,8'E), no depth given.

*Mangilia septangularis* (*non* Montagu, 1803); Sowerby, 1892: 7; Smith, 1904a: 22.

Diagnosis: Shell narrowly to biconic-claviform, b/l 0,35–0,46, spire relatively low (a/l 0,37–0,47) and somewhat cyrtoconic, apex rather papilliform, base short and truncate, suture more or less crenated, labral edge gently curved, termination of siphonal canal not indented, parietal nodule small, labrum moderately convex in side-view, anal sinus shallow but distinct; axial ribs widely spaced, low to obsolete on body whorl, 8–10 on penultimate whorl; spiral lirae barely raised, 22–25 on penultimate whorl; white, dorsum of body whorl sometimes tinged with flesh, usually with staggered orange-brown axial marks between ribs; protoconch breadth 0,78–0,80 mm, b/h 1,07–1,15; length exceeds 12,2 mm.

Description: Shell narrowly to biconic-claviform (b/l 0,35–0,46, a/l 0,37–0,47) with high, somewhat cyrtoconic spire and moderately acute, somewhat papilliform apex, base short and truncate; teleoconch whorls about $5\frac{1}{2}$, gently to moderately convex with periphery below midwhorl, slightly concave about one-third of whorl below suture (but not forming a sulcus or subsutural cord), suture shallow, more or less strongly crenated by rib-terminations; left side of base of body whorl slightly concave, fasciole weak and short to absent, no false umbilicus. Aperture oblong, rather linear, labral edge gently curved, labium sinuous, columella convex to almost straight, siphonal canal short, wide, slightly curved to left, its termination not indented, labial callus moderately thick, forming a slight nodule in posterior angle of aperture; labrum preceded by a thick varix, its edge moderately convex in side-view, with a slight stromboid notch and a shallow, gently concave anal sinus.

Glossy, sculptured by flexuous axial ribs (sometimes continuous from whorl to whorl) and dense, close-set spiral threads with very shallowly incised intervals, growth-lines fine, with an occasional very coarse one, terminal varix strong,

sometimes preceded by a second varix on dorsal or ventral face of body whorl. Axial ribs suture-to-suture, extending onto base of body whorl almost to rostrum, arcuate (reversed-sigmoid on last whorl), slightly opisthocline to straight, narrower than intervals, low to obsolete on body whorl, on spire crests of ribs rather sharp in cross-section, sides gradually sloping; 9–10 axials on 1st whorl, 8–10 on penultimate whorl. Spiral threads barely raised, rendered minutely and feebly pliculate by growth-lines, their intervals somewhat micropunctate; threads not developed or irregular on 1st whorl, 7–10 on 2nd (but feeble below suture), 22–25 on penultimate whorl, with approximately 26–32 on base of body whorl, those on rostrum somewhat rounded.

Yellowish-white, ribs paler, intercostal spaces usually with a few irregularly staggered axial blotches of moderate to brownish-orange; dorsum of body whorl sometimes tinged with pale orange-yellow; protoconch usually tinged with yellow.

Protoconch somewhat mammillated, of about 3 strongly convex whorls, the apical one small; smooth except for a few well-developed, arcuate, opisthocline riblets on terminal quarter-whorl; breadth 0,78–0,80 mm, height 0,68–0,75 mm (b/h 1,07–1,15).

Dimensions: 10,3 × 3,8 mm, 9,7 × 3,8 mm; attains at least 12,2 mm (apex broken).

Operculum narrowly oblanceolate, somewhat unguiculate, nearly filling aperture, apex sharp, with terminal nucleus, posterior end sharply rounded, growth-lines very coarse, giving surface a plicate appearance; pale yellowish.

Radula (Fig. 56) typical for genus; about 31 rows of teeth.

Range: Agulhas Bank and Cape littoral, from False Bay to off East London.

Locality data (all NM): FALSE BAY: Simonstown dredgings (A2823: Mrs C. M. Connolly). EASTERN CAPE: Port Alfred (B5921: R. K.; B6765: W. H. Turton; B4393: H. Becker (det. Sowerby as *Mangilia septangularis*); B705: E. K. Jordan; B1096: J. Hutt); off East London, 50 m, grey muddy sand, worn tubes, numerous ophiuroids (B7890: *MN*); off Gonubie Point, 40 m, gorgonians, sponges, rocks (NM D268: *MN*).

Type material: Holotype USNM 117 (*fide* Bartsch), that of *H. dora* presumably ZMB.

Notes: Moderately common in beach-drift (although invariably worn) at Port Alfred, but nowhere else. Range situated to the west of the following species.

**Haedropleura summa** sp. n.

Figs 1, 29, 55, 273–274

Diagnosis: Shell narrowly claviform, b/l 0,34–0,36, spire relatively high (a/l 0,32–0,36) and somewhat orthoconic, apex not papilliform, base short and truncate, suture regularly crenated, labral edge almost straight, termination of siphonal canal slightly indented, parietal nodule slight, labrum strongly convex in side-view, anal sinus shallow but distinct; axial ribs not widely spaced, not obsolete on body whorl, 13–17 on penultimate whorl; spiral lirae barely raised, 28–36 on penultimate whorl; white with an occasional orange-brown blotch below suture; protoconch breadth 0,85–0,88 mm, b/h 1,13–1,17; length 12,7 mm.

Description: Shell narrowly claviform (b/l 0,34–0,36, a/l 0,32–0,36) with high, orthoconic spire and moderately acute apex, aperture small, base short and truncate; teleoconch whorls nearly 7, gently convex with periphery below midwhorl, slightly concave about one-third of whorl below suture (but not forming a sulcus or subsutural cord), suture shallow, regularly crenated by rib terminations; left side of base of body whorl slightly concave, fasciole weak and short, no false umbilicus. Aperture oblong, rather linear, labral edge more or less straight, labium sinuous, columella convex to almost straight, siphonal canal short, wide, slightly curved to left, its termination slightly indented, labial callus moderately thick, forming a small nodule in posterior angle of aperture; labrum preceded by a thick varix, its edge rather strongly convex in side-view, with a slight stromboid notch and a shallow, gently concave anal sinus.

Glossy, sculptured by flexuous axial ribs (more or less continuous from whorl to whorl) and dense, close-set spiral threads with very shallowly incised intervals, growth-lines fine, with an occasional coarse one, terminal varix strong. Axial ribs suture-to-suture, extending onto base of body whorl almost to rostrum, arcuate (reversed-sigmoid on last whorl), slightly opisthocline, narrower than intervals, crests rather sharp in cross-section, sides gradually sloping; 10–11 axials on 1st whorl, 13–17 on penultimate whorl. Spiral threads barely raised, rendered minutely and feebly pliculate by growth-lines, threads not developed or irregular on 1st whorl, about 7 on 2nd (but feeble below suture), 28–36 on penultimate whorl, with approximately 32–38 on base of body whorl, those on rostrum somewhat rounded.

Yellowish-white with an occasional small moderate to brownish-orange blotch below suture (not restricted to intercostal spaces), protoconch tinged with yellow.

Protoconch (Fig. 29) somewhat mammillated, of about 3 strongly convex whorls, the apical one small; smooth except for a few well-developed, arcuate, opisthocline riblets on terminal quarter-whorl; breadth 0,85–0,88 mm, height 0,75–0,78 mm (b/h 1,13–1,17).

Dimensions: 12,7 × 4,3 mm (holotype); 11,8 × 4,3 mm (paratype).

Operculum (Fig. 1) as in *H. ima*.

Radula (Fig. 55) typical for genus; 23 rows of teeth.

Range: Continental shelf of Natal and Transkei, 66–125 m.

Type material: Holotype NM D1287/T3615, off Amanzimtoti, Natal (30°05,8′S, 31°59,7′E), 115–125 m, medium sand. Paratype 1 (a juvenile) NM D4015/T3616, off Durban, 104–110 m, muddy sand, broken shell. Paratype 2, NM C9884/T3617, off Port Grosvenor, Transkei, 80 m, calcareous nodules; apex, operculum and radula slide M211; paratype 3, NM C7325/T3619, same data. Paratype 4, NM C4784/T3618, off Mendu Point, Transkei, 66 m, coarse sand and rubble. All dredged *MN*.

Notes: Similar to *H. ima* from the Agulhas Bank and Cape littoral, but spire markedly higher and axial ribs closer and more numerous; other differences are indicated in the respective diagnoses. In live-taken examples, the barely incised spiral grooves are visible more through their milk-white opacity than through their relief. Of Indo-Pacific species, *Horaiclavus (Cytharoclavus) stenocyma* Kuroda &

Oyama, 1971, from Japan, is probably comparable, although the original figure and description are of little value; it has fewer axial ribs than *summa* and appears to differ in colour.

Etymology: *summus* = highest (to conform with *'ima'* (= lowest), *H. ima* being the lower-spired species), L.

### *Ceritoturris* Dall, 1924.

*Ceritoturris* Dall, 1924: 88. Type species (o.d.) *C. bittium* Dall, 1924.

Diagnosis: Shell tiny (5–7 mm), narrowly claviform with high spire, narrow aperture and short, truncate base, siphonal canal spout-like, not notched terminally, parietal nodule large, greatly constricting anal sinus, which is deep, asymmetrically U-shaped, and directed somewhat abapically, with its apex situated high on shoulder slope; labrum preceded by a varicoid swelling; sculptured by axial ribs crossed by strong spiral lirae, subsutural cord thin and weak, entire surface covered by microscopic granules. Protoconch proportionally large, conical of $3\frac{1}{2}$ whorls, last two whorls with a median keel. Operculum and radula unknown.

Notes: Previously known only from the type species, which is supposedly endemic to Hawaii. However, a very similar species occurs in south-eastern Africa. *Ceritoturris* is referred to the subfamily Crassispirinae on account of its apparent relationship with *Carinapex* Dall, 1924, whose type species was shown by Powell (1966) to have a crassispirine radula. [An unidentified species from Cocos-Keeling Island, referred to *Carinapex* by Maes (1967), has a borsoniine radula, and is presumably not related.]

### **Ceritoturris nataliae** sp. n.

Figs 275–278

Diagnosis: A typical *Ceritoturris,* with angular whorls, periphery of each whorl median, body whorl biangulate; b/l 0,37–0,45, a/l 0,30–0,35); axial ribs strong, broad, equal to intervals, in section strongly rounded with rather steep sides, 8–9 ribs per whorl; spiral lirae thin but with sharply-cut sides, 3 per whorl on later whorls, 7–10 on base of body whorl; vivid orange-pink; protoconch breadth 0,60–0,63 mm. Attains 5,2 mm.

Description: Shell narrowly claviform (b/l 0,37–0,45, a/l 0,30–0,35), with very high spire, whose whorls increase gradually in size, last whorl somewhat contracted, base moderately short, siphonal canal spout-like, bent strongly to right; teleoconch whorls about $5\frac{1}{2}$, suture shallow; each whorl angularly convex, with median periphery, body whorl biangulate; subsutural cord thin and weak, its bordering sulcus shallow and declivous; left side of base of body whorl concave, with strong fasciole, no false umbilicus. Labial callus moderately thick, its outer edge barely free on columella, parietal nodule large, pointed and somewhat tongue-like, projecting sideways and filling posterior angle of aperture and constricting anal sinus; columella gently convex; siphonal canal shallow, curved slightly to right, termination not indented dorsally; anal sinus widely U-shaped in juvenile, in adult constricted and slot-like, directed somewhat abapically.

Sculptured by broad, strong axial ribs, crossed by narrow spiral lirae; growth-lines coarse, surface microshagreened with minute granules (Fig. 278); lip preceded by a broad, low, varicoid swelling. Axial ribs somewhat orthocline, evanescing gradually on shoulder slope and on base at level of parietal/columella junction, equal in width to intervals, in t/s strongly rounded, with rather steep sides; all whorls with 8–9 ribs. Spiral lirae low, but with sharply-cut sides; peripheral lira starting on 1st whorl, a second lira developing above suture at least by third whorl, a third, weaker lira forming above periphery on later whorls; on body whorl the supersutural lira is nearly as strong as peripheral one; base of body whorl with a weaker series of widely spaced threads, 7–10 in number and subequal to one another. Colour near strong yellowish-pink, aperture sometimes tinged with pinkish-brown.

Protoconch (Fig. 277) a conical sinusigera of about 3 whorls, last $1\frac{3}{4}$ whorls with a median keel, lip strongly opisthocline, with a deep embayment on slope above keel, sometimes preceded by strong growth-lines; breadth 0,60–0,63 mm, height 0,53–0,60 mm (b/h 1,03–1,19).

Dimensions: 5,0 × 1,9 mm (holotype); length 5,2 mm (largest paratype).

Operculum, radula and soft parts unknown.

Range: Continental shelf of Natal and Zululand, 50–90 m, in fine muddy sand.

Type material: Holotype NM C9959/T3820, off Durban (29°50,5′S, 31°09,6′E), 75 m, sandy mud with shell rubble. Paratypes 1–4, NM C9958/T3819, same data. Paratype 5, NM D4432/T3559, off Durban, 80–90 m, grey sandy mud. Paratypes 6–8, NM D4413/T3560, off Cooper Lighthouse, Durban, 88 m, firm grey muddy sand. Paratype 9, NM A6193/T3561, off St Lucia Lighthouse, 50 mm, CSIR Water Res. bottom sample. Paratype 10, NM D9968/T3942, off Kosi Bay, 50 m, fine muddy sand. Paratype 11, NM D7539/T3943, off Hully Point, Zululand, 50 m, fine sand. Unless otherwise stated, dredged *MN*.

Notes: The species differs from its only known congener, *C. bittium* Dall, 1924, in its markedly angular whorls and much stronger axial ribs. The freshest specimens (paratypes 10 and 11), both dredged off northern Zululand, were collected subsequent to the preparation of the SEM photographs.

Etymology: Named after the trekker republic of Natalia, the first regional name undoubtedly applicable to the present-day Natal.

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Figs 57–72. Doubtful taxa and *Drillia (Drillia s.s.)* species. **57–58**, *Agladrillia macella* (Melvill, 1923), holotype of *Turris (Surcula) macella,* BM(NH) 1982084, 17,2 × 5,0 mm. **59–60**, [*Drillia* = *Clionella* or *Clavatula*] *signa* Bartsch, 1915, holotype, USNM 250457, 13,4 × 5,9 mm. **61–66**, *Drillia (Drillia) caffra* (Smith, 1882): **61**, NM B748, Jeffreys Bay, 23,7 × 8,5 mm; **62–63**, NM 4401, Jeffreys Bay, 17,2 × 7,2 mm; **64**, NM D4379, Jeffreys Bay, 25 m, 14,0 × 6,1 mm; **65–66**, NM C4503, off Sandy Point, 90 m, 15,7 × 6,5 mm. **67–69**, *Drillia (Drillia) lignaria* (Sowerby, 1903): **67**, lectotype, BM(NH) 1903.7.27.52, 22,1 × 8,6 mm; **68–69**, NM A4056, off Cape St Blaize, *ex pisce*, 21,5 × 7,5 mm and 21,8 × 8,8 mm respectively. **70–72**, *Drillia (Drillia) spirostachys* sp. n.: **70–71**, holotype, NM D1506, 17,2 × 5,8 mm; **72**, paratype, NM D816, off Umlaas Canal, 150 m, 13,8 × 4,5 mm.

Figs 73–86. *Drillia (Clathrodrillia)*, *Clavus* and *Iredalea* species. **73–74**, *Drillia (Clathrodrillia) connelli* sp. n., holotype, NM D4822, 29,1 × 11,2 mm. **75–77**, *Clavus unizonalis* (Lamarck, 1822): **75–76**, NM K332, Quisiva Island, Mozambique, 17,7 × 8,8 mm; **77**, NM J3468, East New Britain, Papua New Guinea, 20,1 × 9,4 mm. **78–79**, *Clavus groschi* sp. n., holotype, NM G3034, 22,8 × 9,5 mm. **80–84**, *Iredalea exilis* (Pease, 1868): **80**, lectotype of *Drillia exilis*, ANSP 15690, 5,4 × 1,9 mm; **81**, lectotype of *Drillia pusilla* Garrett, 1873, ANSP 15689, 6,5 × 2,7 mm; **82**, NM J4097, Conducia Bay, Mozambique, 7,0 × 2,7 mm; **83–84**, A4439, Durban Bay, 7,9 × 2,8 mm. **85–86**, *Iredalea ?exilis* (Pease, 1868): NM G4664, Benguera Island, 5,1 × 2,3 mm.

Figs. 87–100. *Iredalea* and *Tylotiella* species. **87–90**, *Iredalea inclinata* (Sowerby, 1893): **87–88**, holotype or figured syntype, BM(NH) 1879.12.24.3, 20,0 × 7,8 mm; **89–90**, NM H2471, Conducia Bay, Mozambique, 24,3 × 9,1 mm. **91–93**, *Tylotiella burnupi* (Sowerby, 1897): **91**, NM B5743, Durban, 12,0 × 4,4 mm; **92**, NM C3859, Mbotyi, 10,3 × 3,6 mm; **93**, NM C5650, Mkambati, 11,1 × 3,9 mm. **94**, *Tylotiella ?burnupi,* NM J487, between Maputo and Zavora, *ex pisce*, 11,6 × 4,1 mm. **95–96**, *Tylotiella decaryi* (Dautzenberg, 1932), syntype, IRSN 8291, Itomanyry, Madagascar, 9,4 × 3,3 mm. **97–100**, *Tylotiella basipunctata* sp. n.: **97–98**, holotype, NM J7177, 9,1 × 3,3 mm; **99**, paratype, NM H5584, Conducia Bay, 9,5 × 3,7 mm; **100**, paratype, NM J4095, Conducia Bay, 10,9 × 3,8 mm.

Figs 101–113. *Tylotiella* species. **101–104**, *T. isibopho* sp. n.: **101–103**, holotype, NM C5296, 16,4 × 6,1 mm; **104**, paratype, NM C9485, off Whale Rock, 90 m, 13,1 × 5,2 mm. **105–108**, *T. herberti* sp. n.: **105**, holotype, NM C7411, 10,8 × 4,0 mm; **106**, paratype, NM C8180, Mbotyi, 9,8 × 3,8 mm; **107**, paratype, NM C8180, Mbotyi, 10,1 × 4,2 mm; **108**, paratype, banded form, NM C8180, Mbotyi, 8,7 × 3,5 mm. **109–113**, *Tylotiella hottentota* (Smith, 1882): **109**, holotype, BM(NH), 12,5 × 4,7 mm; **110–112**, NM A1593, Port Alfred, 14,0 × 4,9 mm and 15,3 × 5,3 mm respectively; **113**, NM A2791, Cape Agulhas, 16,0 × 5,5 mm.

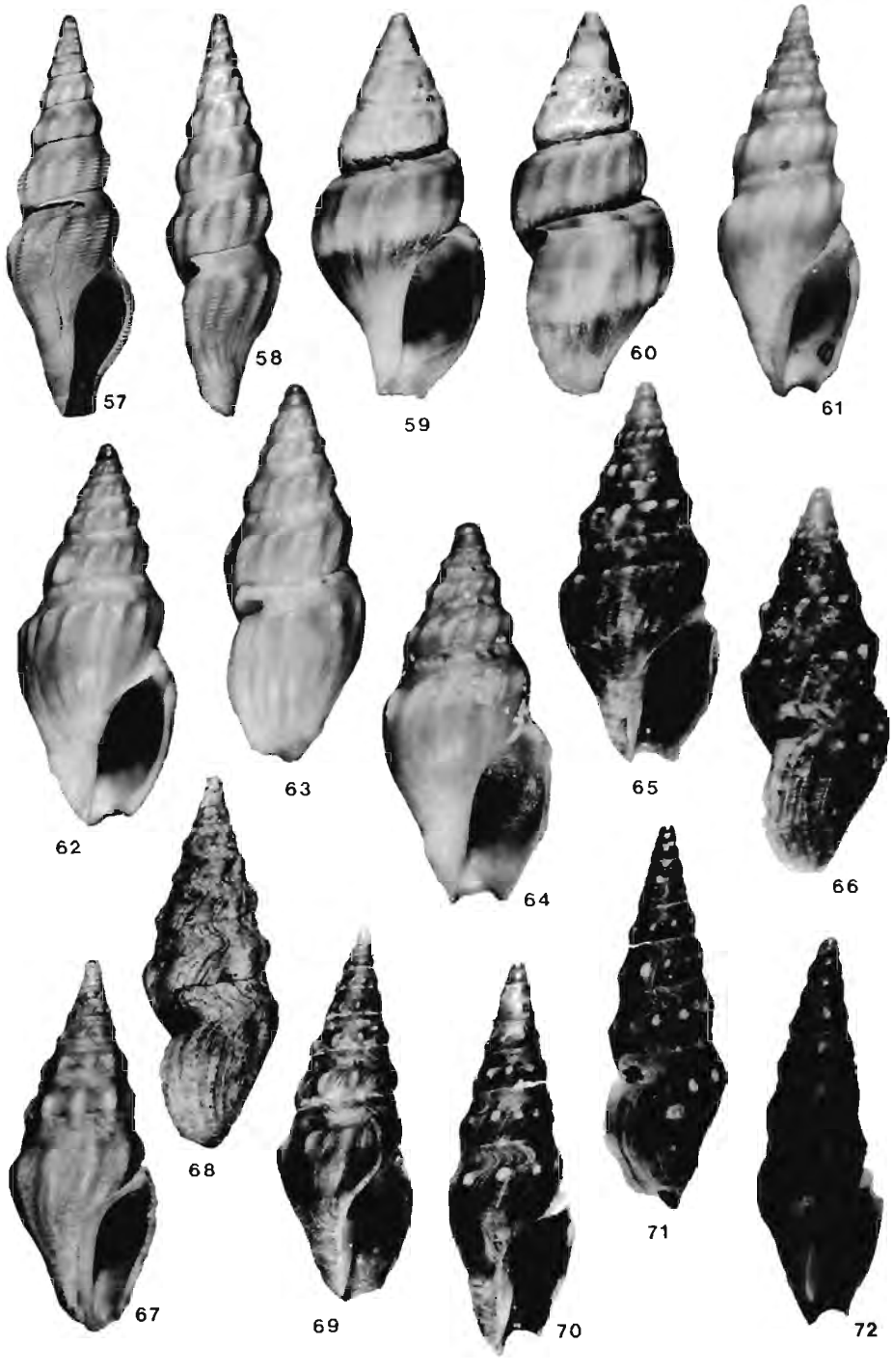
Figs 114–127. *Tylotiella* and *Orrmaesia* species. **114–115**, *Tylotiella papilio* sp. n., holotype, NM A5617, 12,7 × 4,4 mm. **116–117**, *T. falcicosta* (Barnard, 1958), lectotype, SAM A8724, 5,7 × 2,7 mm. **118–119**, *T. quadrata* sp. n., holotype, NM C7227, 8,9 × 4,0 mm. **120–122**, *T. sulekile* sp. n.: **120–121**, holotype, NM D4049, 8,7 × 3,4 mm (120 coated with $MgCl_2$); **122**, paratype, NM J490, between Maputo and Zavora, *ex pisce*, 9,0 × 4,0 mm. **123–127**, *Orrmaesia dorsicosta* sp. n.: **123–124**, holotype, NM C9487, 6,7 × 2,5 mm; **125**, paratype, pale form, NM C6400, off Mendu Point, 250 m, 6,5 × 2,6 mm; **126–127**, paratype, C7294, off Whale Rock, 90 m, 6,0 × 2,6 mm.

Figs 128–141. *Orrmaesia* and *Splendrillia* species. **128–129**, *Orrmaesia nucella* sp. n., holotype, NM C7290, 3,8 × 1,9 mm. **130–132**, *O. ancilla* (Thiele, 1925): **130–131**, SAM A8762, off Cove Rock, 22 fath., 4,2 × 1,8 mm; **132**, do, 5,0 × 1,8 mm. **133–134**, *Splendrillia falsa* (Barnard, 1958), holotype, SAM A30401, 9,4 × 3,7 mm. **135–136**, *S. eva* (Thiele, 1925), NM B8847, off Melvill, 380–420 m, 7,8 × 3,2 mm. **137–139**, *S. kylix* sp. n.: **137–138**, holotype, NM C9487, 6,7 × 2,5 mm. **139**, paratype, NM C9066, off Mbashe River, 450–500 m, 7,8 × 3,1 mm. **140–141**, *S. ?kylix* sp. n., NM C4998, off Mendu Point, 405–420 m, 7,8 × 3,2 mm.

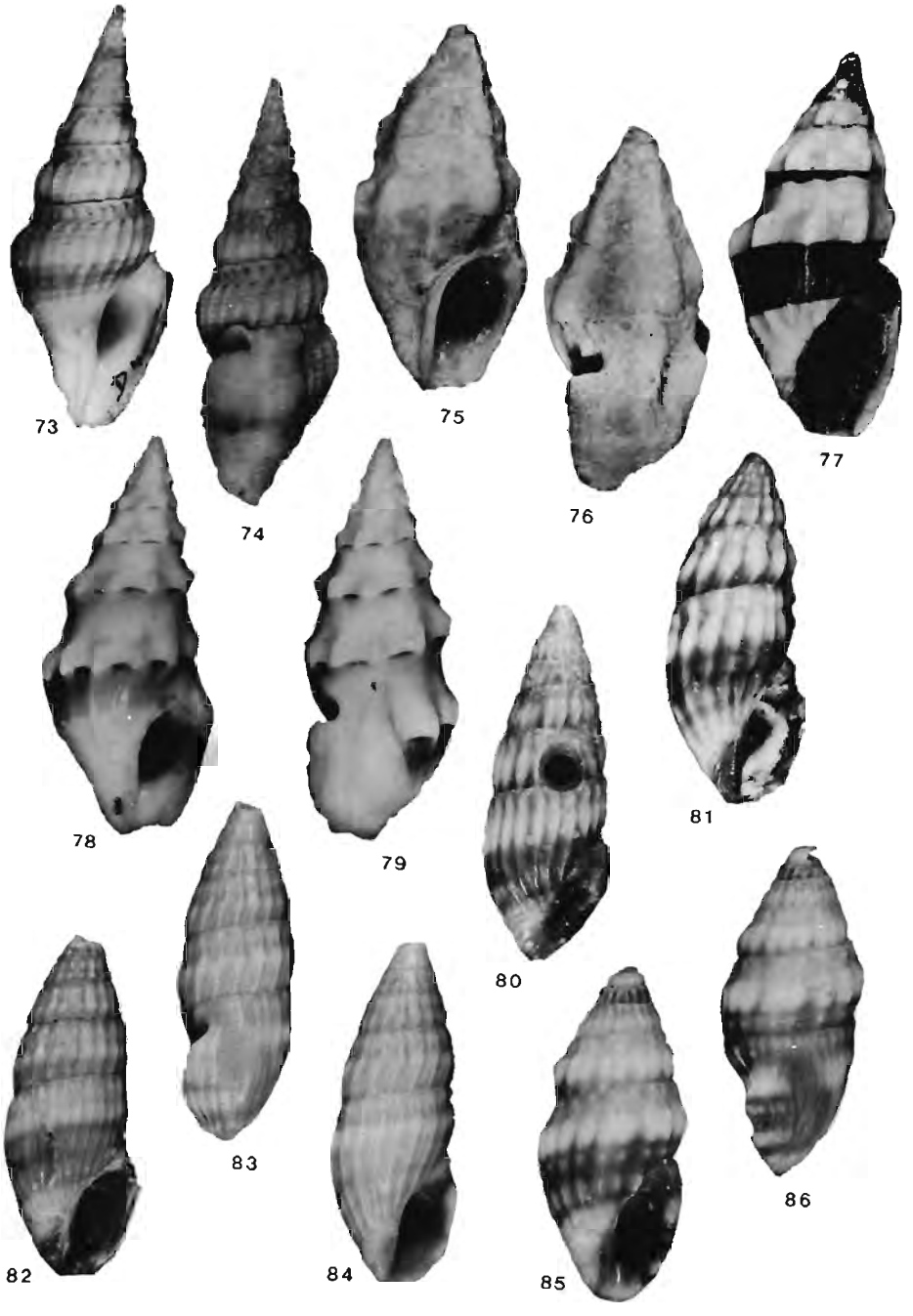
Figs 142–154. *Splendrillia* species. **142–143**, *Splendrillia alabastrum* sp. n., holotype, 8,7 × 3,7 mm. **144–148**, *S. skambos* sp. n.: **144–145**, holotype, NM C2073, 7,5 × 3,1 mm. **146**, paratype, NM C1882, off Rame Head, 410–430 m, 7,0 × 3,1 mm; **147–148**, paratype, mud-dwelling form, NM C8875, off Mgazi, 350 m, 7,9 × 3,4 mm. **149–150**, *S. mikrokamelos* sp. n., holotype, NM C7598, 6,2 × 2,6 mm. **151–154**, *S. sarda* sp. n.: **151–152**, holotype, NM C9877, 9,2 × 3,7 mm; **153**, paratype, NM C7466, off Mbashe River, 200–220 m, 8,1 × 3,2 mm; **154**, paratype, NM C6564, off Mendu Point, 300 m, 11,2 × 4,1 mm.

Figs 155–169. *Splendrillia*, *Agladrillia* and *Acinodrillia* species. **155–156**, *Splendrillia daviesi* sp. n., holotype, NM C2040, 22,2 × 7,1 mm. **157–158**, *Agladrillia ukuminxa* sp. n., holotype, NM C7487, 8,7 × 3,5 mm. **159–160**, *Agladrillia piscorum* sp. n., holotype, NM B1009, 12,6 × 4,5 mm. **161–162**, *Agladrillia(?) benjamini* (Bartsch, 1915), holotype, USNM 210, 14,6 × 5,6 mm. **163–164**, *Acinodrillia amazimba* sp. n., holotype, NM C4485, 8,8 × 3,7 mm. **165–166**, *Acinodrillia viscum* sp. n.: **165**, holotype, NM C7436, 7,2 × 3,1 mm; **166**, paratype, NM C7278, off Mgazi, 180 m, 6,9 × 2,9 mm. **167–169**, *Acinodrillia paula* (Thiele, 1925): **167**, NM A4078, off Cape St Blaize area, *ex pisce*, 10,3 × 4,0 mm; **168**, do, 10,8 × 4,2 mm; **169**, NM A4028, off False Bay area, *ex pisce*, length 11,8 mm.

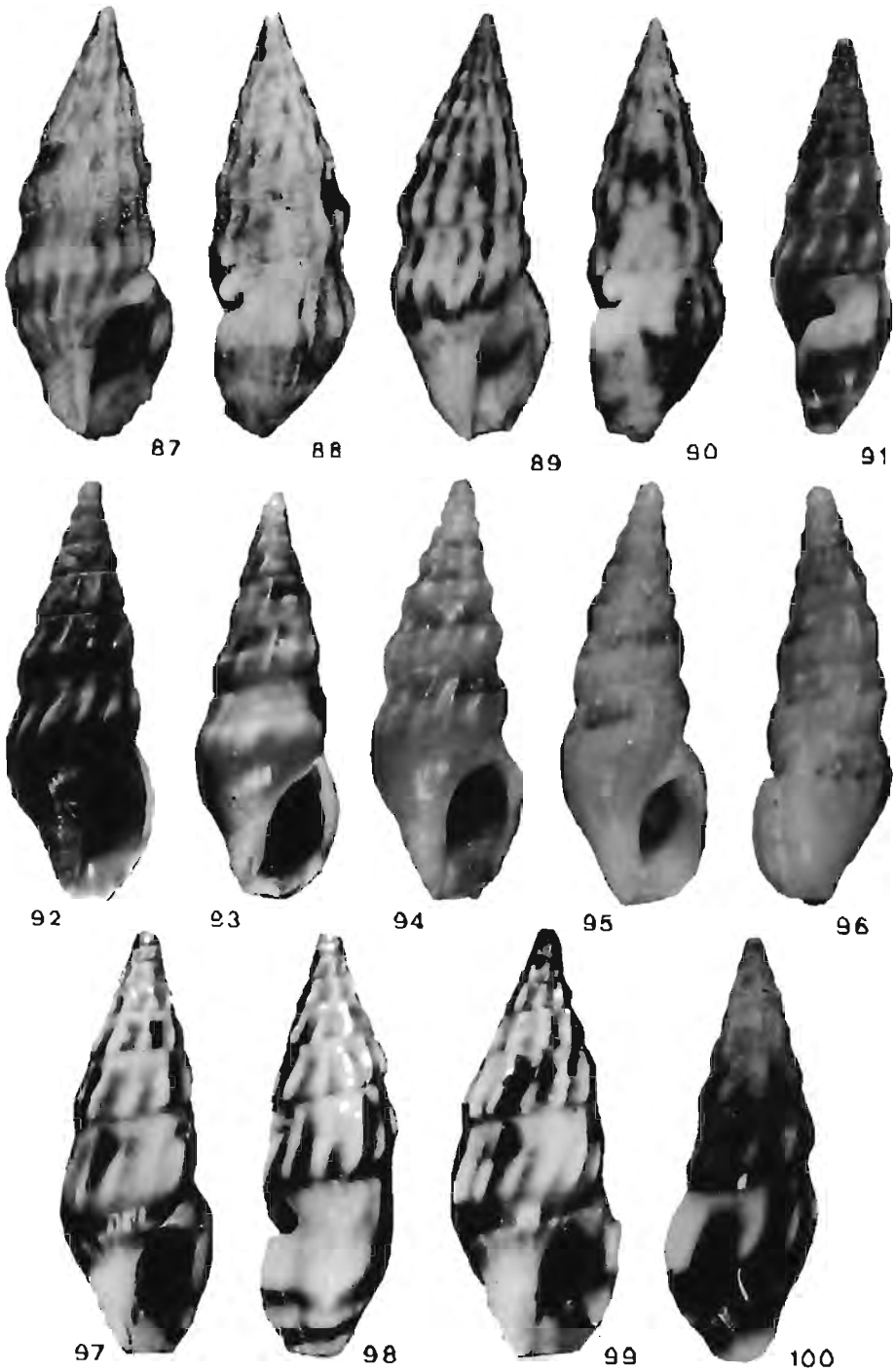
Figs 57–169 follow



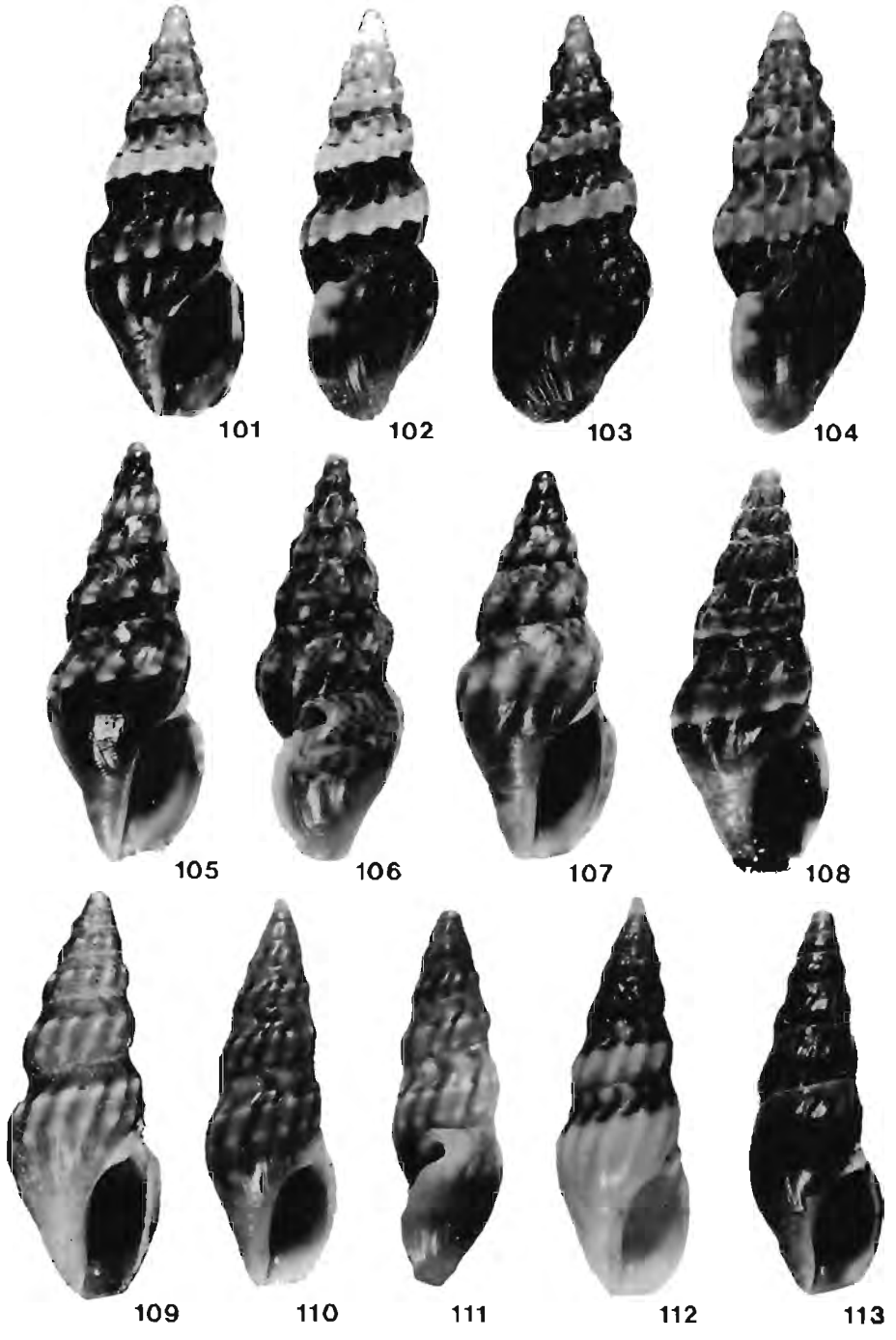

Figs 57–72



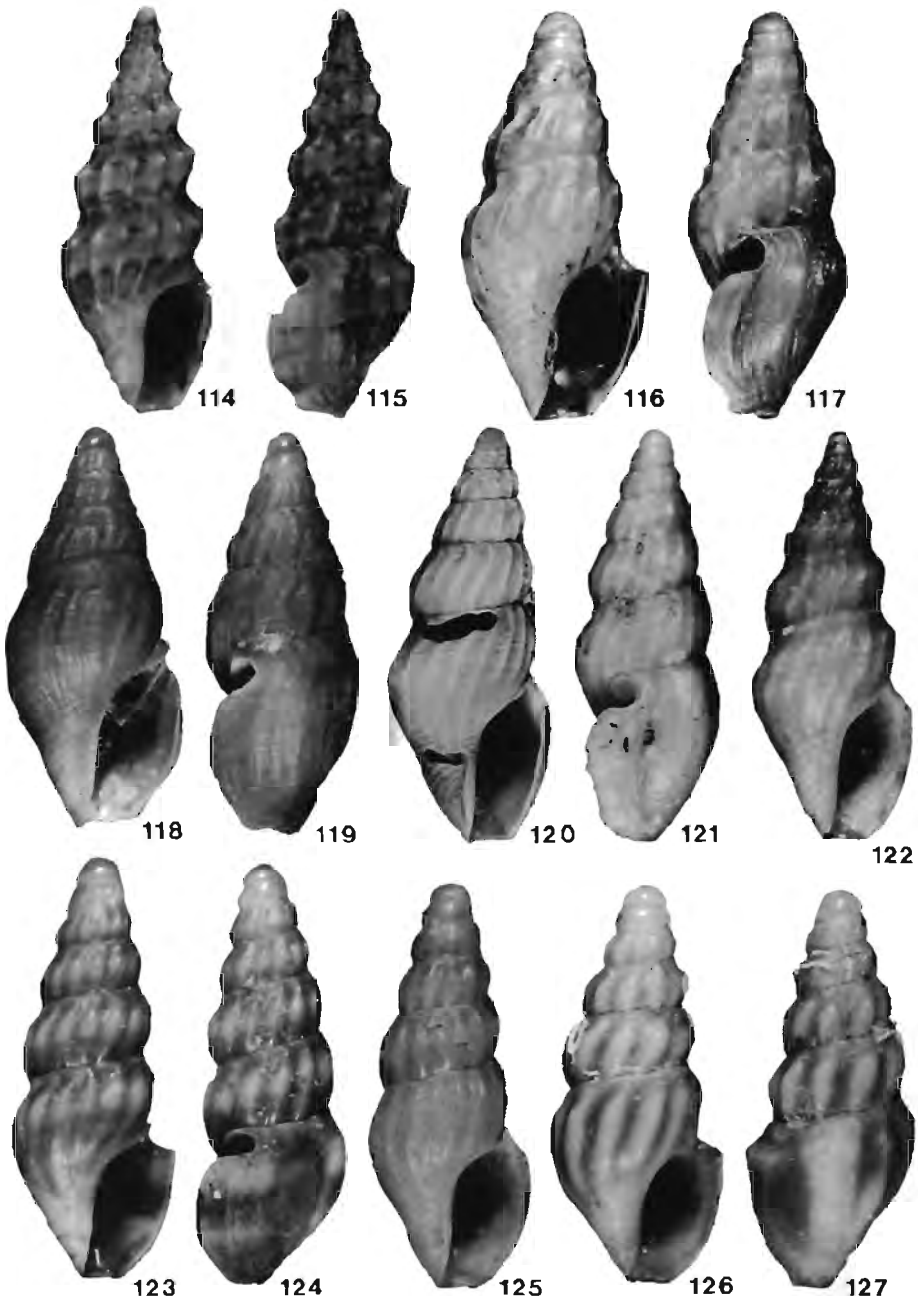

Figs 73–86



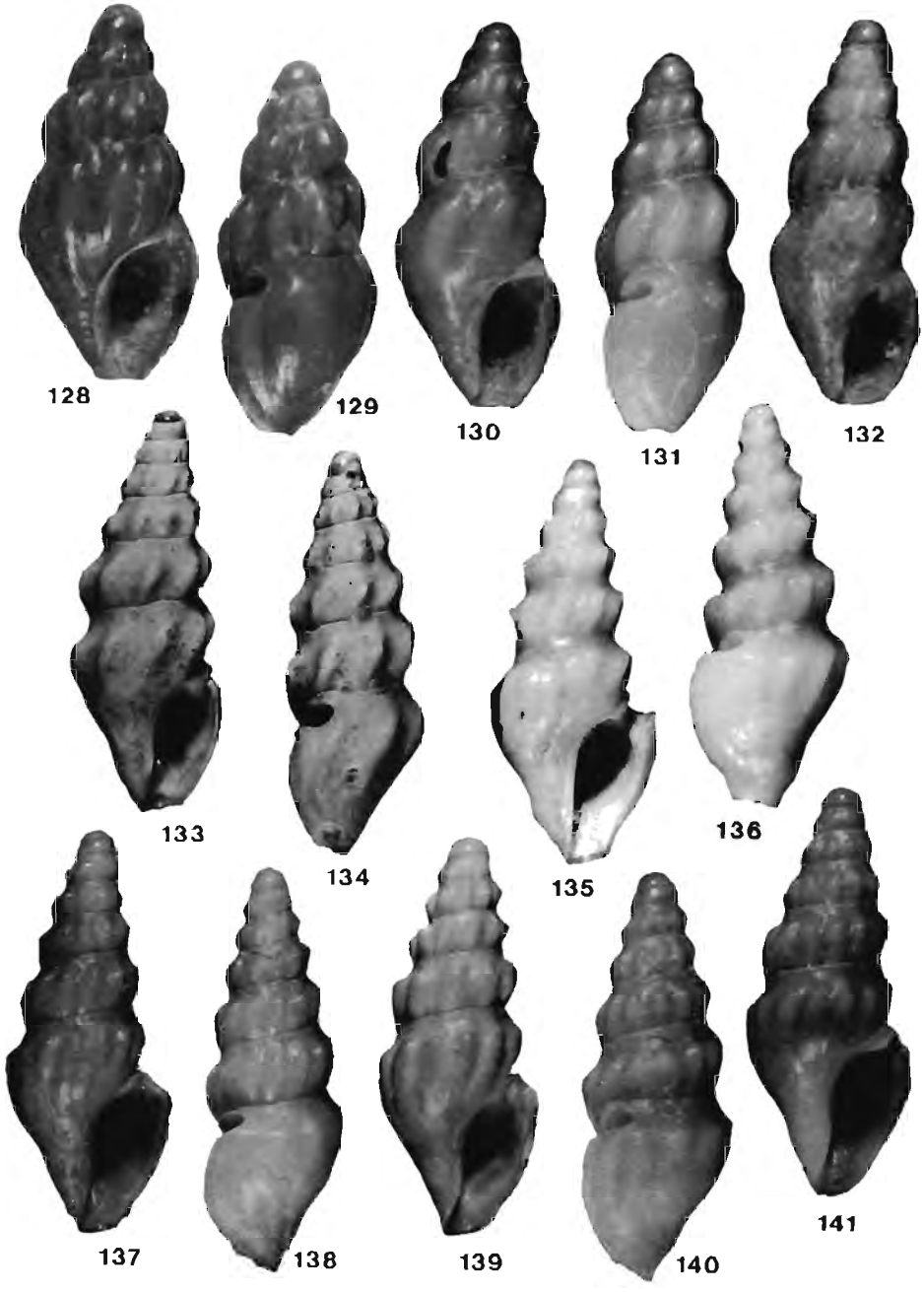

Figs 87–100



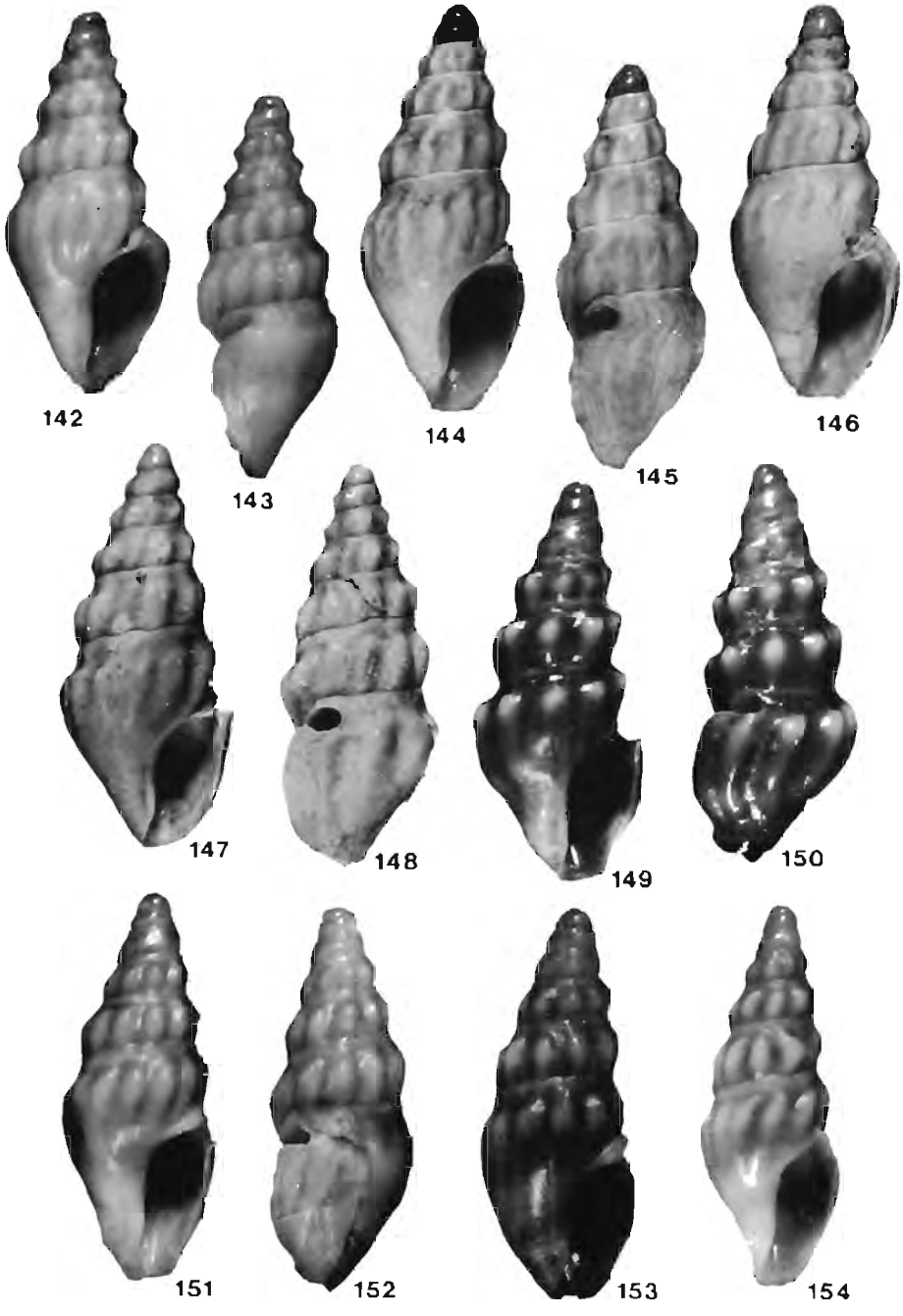

Figs 101–113



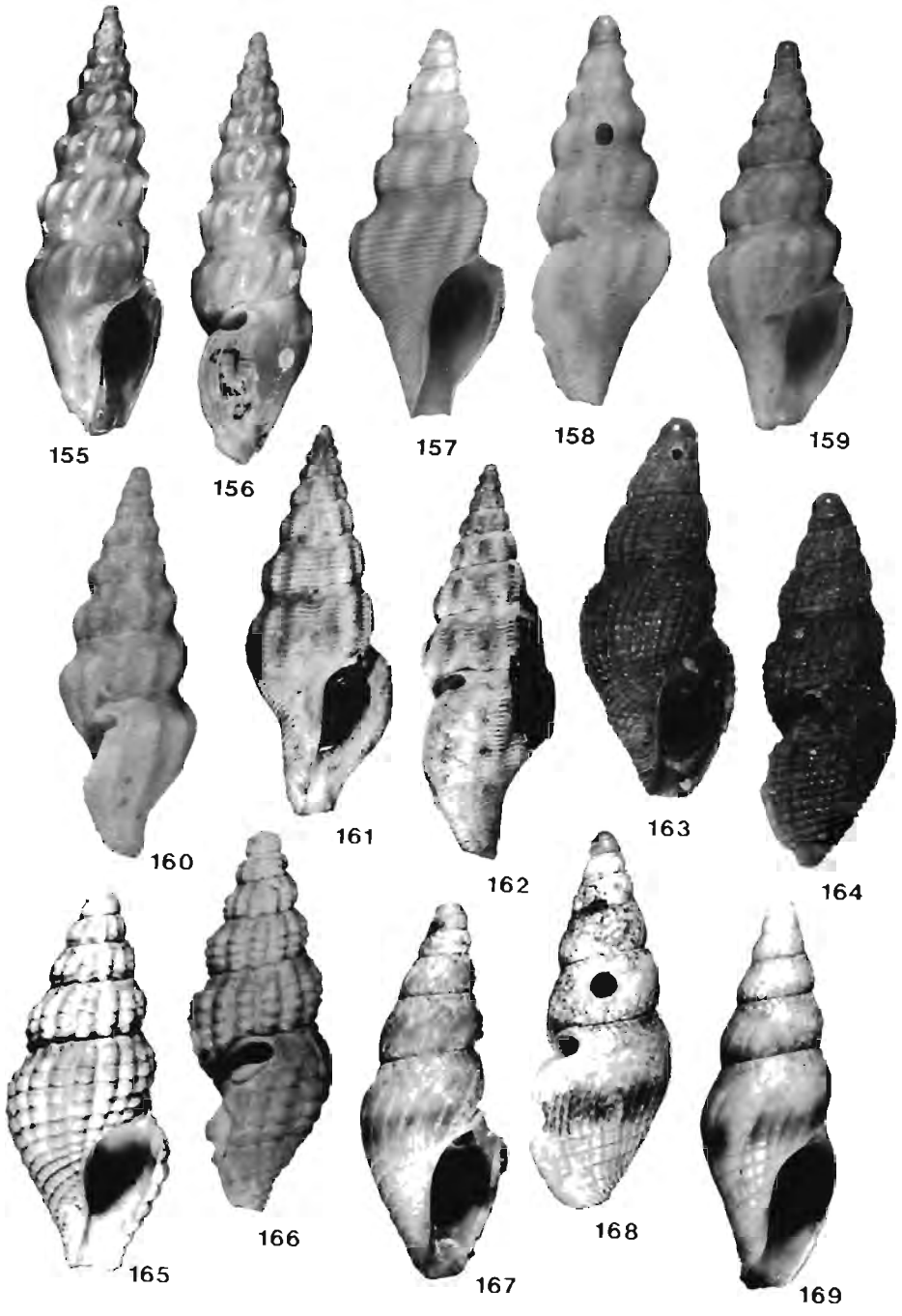

Figs 114–127




Figs 128–141




Figs 142–154




Figs 155–169

Figs 170–183. *Paradrillia, Inkinga, Turridrupa, Pseudexomilus* and *Crassiclava* species. **170–171**, *Paradrillia melvilli* Powell, 1969, NM C9936, off Mbotyi, 45 m. **172–174**, *Inkinga platystoma* (Smith, 1877): **172–173**, NM 5929, Port Elizabeth littoral, 12,9 × 5,1 mm; **174**, NM C9936, off Mbotyi, 45 m, 9,3 × 3,2 mm. **175–176**, *Inkinga cockae* (Kilburn, 1977), NM B5900, off Port Edward, 100 m, 8,8 × 2,8 mm. **177–178**, *Pseudexomilus fenestratus* sp. n., holotype, NM D4551, 13,5 × 5,1 mm. **179**, *Turridrupa acutigemmata* (Smith, 1877), NM B4011, Ledsman Shoal, 100 m, 18,3 × 5,8 mm. **180–182**, *Crassiclava layardi* (Sowerby, 1897): **180–181**, Kommetjie, 12,0 × 4,8 mm; **182**, NM B4382, Port Alfred, 12,2 × 4,4 mm. **183**, *Crassiclava castanea* (Reeve, 1845), holotype of *Pleurotoma castanea*, BM(NH) 1875.4.26.23, 16,3 × 10,4 mm.

Figs 184–197. *Crassiclava, Buchema* and *Nquma* species. **184**, *Crassiclava omia* (Barnard, 1958), lectotype, SAM A8651, 9,8 × 4,2 mm. **185–186**, *C. balteata* sp. n., holotype, NM D4484, 14,5 × 5,1 mm. **187**, *C. halistrepta* (Bartsch, 1915), NM D4301, Algoa Bay, 10–15 m, length 36,1 mm. **188–189**, *Buchema dichroma* sp. n., holotype, NM C7445, 7,5 × 3,5 mm. **190–197**, *Nquma rousi* (Sowerby, 1886): **190–191**, NM A2801, East London, 13,6 × 6,7 mm and 11,7 × 5,9 mm, respectively; **192–193**, NM C8183, Mbotyi, 11,5 × 5,4 mm and 14,0 × 6,4 mm respectively; **194**, juvenile, NM A2801, East London, 8,5 × 4,0 mm; **195**, juvenile, NM C3724, Sandy Point, 11,1 × 5,0 mm; **196**, Syntype of *Drillia albotessellata* Smith, 1906, NM 608, 13,8 × 6,1 mm; **197**, NM 3728, Port Shepstone, 18,8 × 7,5 .

Figs 198–212. *Nquma, Mauidrillia* and *Psittacodrillia* species. **198–200**, *Nquma scalpta* sp. n.: **198–199**, holotype, NM D1930, 14,9 × 6,5 mm; **200**, paratype, decollated example, NM 6933, Durban, littoral, 14,8 × 6,5 mm. **201–202**, *Mauidrillia felina* sp. n.: **201**, holotype, NM C8023, 10,8 × 4,2 mm; **202**, paratype, NM C6564, off Qora River, 300 m, 12,0 × 4,6 mm. **203–206**, *Psittacodrillia diversa* (Smith, 1882): **203–204**, NM 5927, Port Alfred, 11,3 × 5,3 mm; **205**, lectotype of *Pleurotoma diversa*, BM(NH) 1874.5.26.4, 12,0 × 5,3 mm; **206**, NM C2699, off Mncwasa Point, 32–35 m, length 14,9 mm. **207–209**, *P. bairstowi* (Sowerby, 1886): **207**, NM 5934, Xora, 9,6 × 3,7 mm; **208–209**, NM A2167, Port Alfred, 10,8 × 4,4 mm. **210–212**, *P. albonodulosa* (Smith, 1904): **210**, NM B228, Mzamba, 8,5 × 3,9 mm; **211–212**, NM 5926, Port Alfred, 8,8 × 4,0 mm and 8,0 × 3,8 mm.

Figs 213–229. *Inquisitor* and *Funa* species. **213–214**, *Inquisitor nodicostatus* sp. n., holotype, NM A1646, 43,7 × 13,1 mm. **215–216**, *I. aesopus* sp. n., lectotype, ZMA colln., 36,5 × 9,1 mm. **217–218**, *I. arctatus* sp. n., holotype, NM D1917, 39,3 × 11,1 mm. **219–221**, *I. latiriformis* sp. n.: **219–220**, holotype, NM D4535, 16,5 × 5,3 mm; **221**, paratype, NM D4521, off Durnford Point, 112 m, 14,4 × 5,3 mm. **222–223**, *I. isabella* sp. n., holotype, NM K587, 20,3 × 6,4 mm. **224–227**, *Funa laterculoides* (Barnard, 1958): **224**, lectotype of *Drillia laterculoides*, SAM A8709, length 17,4 mm; **225**, NM C2339, off Mgazi, 92 m, 31,1 × 9,8 mm; **226–227**, NM B6271, off Umlaas Canal, 80 fath., 26,1 × 7,7 mm. **228–229**, *Funa fraterculus* sp. n., holotype, NM J489, 16,8 × 5,6 mm.

Figs 230–243. *Funa* and *Naudedrillia* species. **230–234**, *Funa tayloriana* (Reeve, 1846): **230–231**, holotype of *Pleurotoma tayloriana*, BM(NH) 1879.2.26.26, 39,8 × 12,7 mm; **232**, NM K322, Quisiva Island, 33,8 × 11,3 mm; **233–234**, NM B3550, off Ledsman Shoal, 100 m, 31,0 × 10,2 mm. **235–236**, *Funa asra* sp. n., holotype, NM D3984, 58,0 × 17,1 mm. **237–238**, *Funa variabilis* (Smith, 1877), holotype, BM(NH) 1985160, 32,1 × 11,1 mm. **239–240**, *Naudedrillia filosa* sp. n., holotype, NM B8239, 14,5 × 5,6 mm. **241–243**, *Naudedrillia perardua* sp. n.: **241–242**, holotype, NM C1184, 13,5 × 4,9 mm; **243**, paratype, NM C4031, off Sandy Point, 94 m, 11,0 × 4,8 mm.

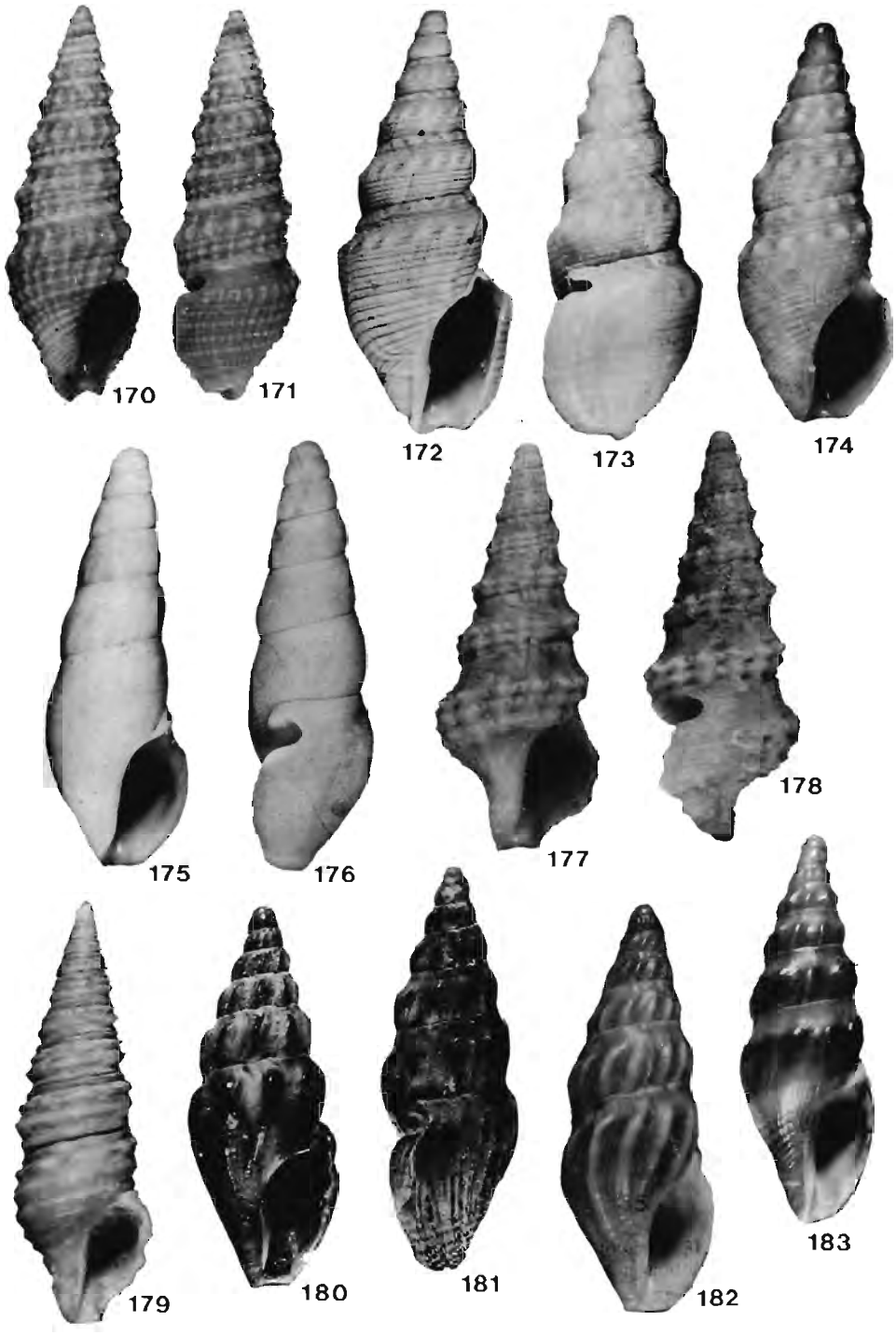
Figs 244–255. *Naudedrillia praetermissa* (Smith, 1904). **244–247**, shallow-water morph: **244**, NM C5993, Dwesa, beach-drift, 14,3 × 5,9 mm; **245–246**, NM C3226, off Whale Rock, 20–26 m, 14,3 × 5,1 mm; **247**, form *lara* Bartsch, 1915, NM A4785, off Mendu Point, 66 m, 14,8 × 5,8 mm. **248–251**, bathymorph I: **248**, NM B7837, off Nahoon, 85 m, 23,9 × 7,9 mm; **249–251**, NM C9633, off Sandy Point, 90 m, 20,4 × 7,4 mm. **252–255**, bathymorph II: **252**, NM C2566, off Mzamba, 100 m, 14,0 × 4,9 mm; **253–254**, C2829, off Whale Rock, 150–200 m, 15,4 × 6,6 mm; **255**, decollated example, NM C4464, off Shixini Point, 140–150 m, 13,7 × 6,4 mm.

Figs 256–268. *Naudedrillia* and *Calcatodrillia* species. **256–257**, *Naudedrillia angulata* sp. n., holotype, NM C2304, 18,2 × 6,4 mm. **258–259**, *N. cerea* sp. n., holotype, NM B3594, 19,1 × 6,8 mm. **260–261**, *N. nealyoungi* sp. n., holotype, NM D822, 26,9 × 8,1 mm. **262–264**, *N. mitromorpha* sp. n.: **262–263**, holotype, NM C7210, 4,9 × 2,1 mm; **264**, paratype, NM C9574, off Sandy Point, 94 m, 5,1 × 2,5 mm. **265–266**, *Calcatodrillia hololeukos* sp. n., holotype, NM D3506, 18,8 × 6,7 mm. **267–268**, *C. chamaeleon* sp. n., holotype, NM D3506, 17,7 × 7,5 mm.

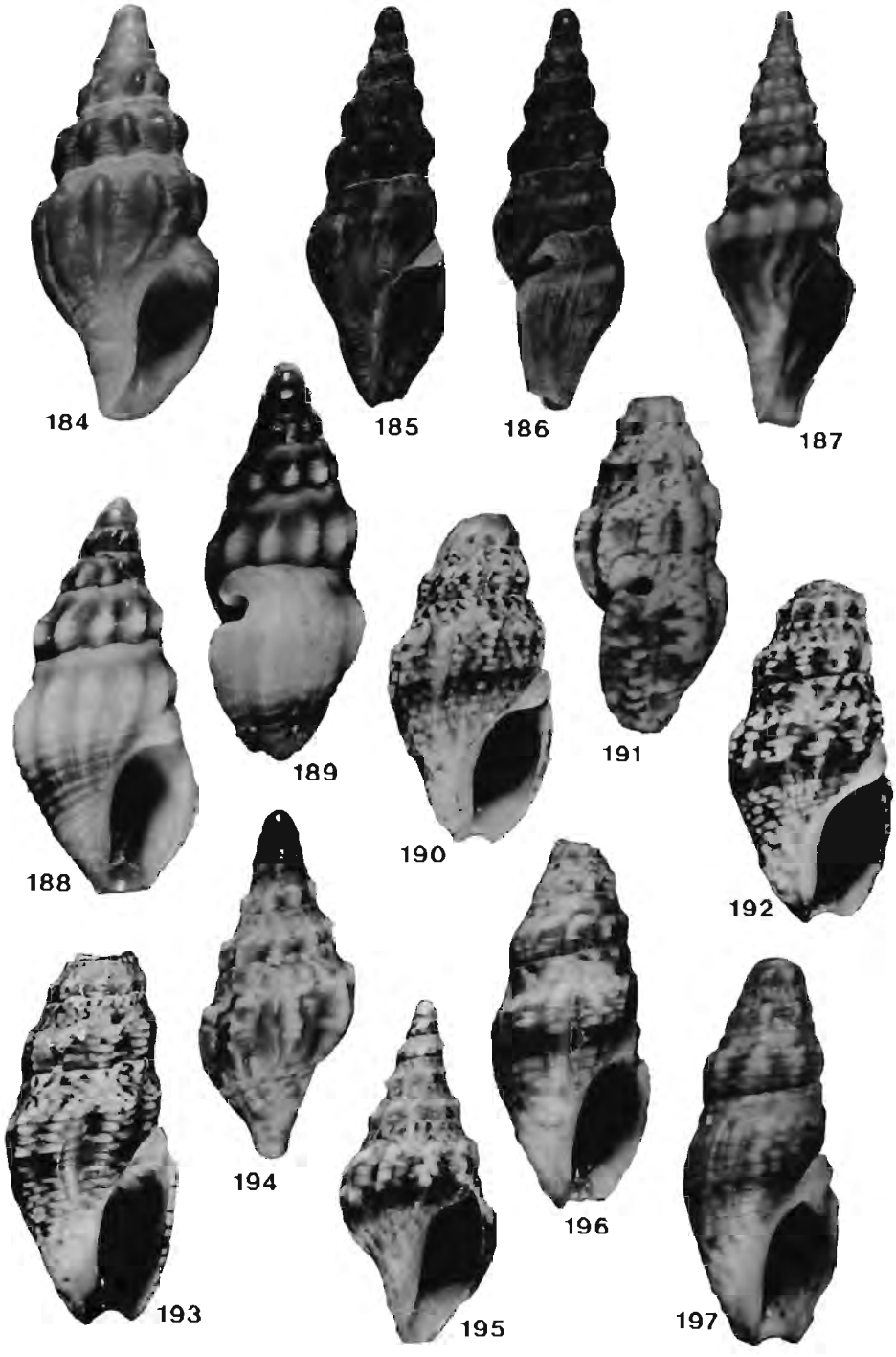
Figs 269–279. *Haedropleura, Ceritoturris* and *Turridrupa* species. **269–272**, *Haedropleura ima* (Bartsch, 1915): **269–270**, NM B7890, off East London, 50 m, 7,9 × 3,2 mm; **271–272**, NM 5921, Port Alfred, beach-drift, 7,4 × 3,2 mm and 9,3 × 3,6 mm respectively. **273–274**, *H. summa* sp. n., holotype, NM D1287, 12,7 × 4,3 mm. **275–278**, *Ceritoturris nataliae* sp. n. (all SEM): **275**, holotype, NM C9959, 5,0 × 1,9 mm; **276**, paratype, NM C9958, 4,4 × 1,7 mm; **277**, protoconch, diameter 0,60 mm; **278**, microshagreen sculpture, magnified. **279**, *Turridrupa acutigemmata* (E. A. Smith, 1877), protoconch, SEM, diameter 1,00 mm.

Figs 280–284. *Inquisitor cerithina* (Anton, 1838), *I. latiriformis* sp. n. and *Funa tayloriana* (Reeve, 1846). **280–281**, *I. cerithina*: **280**, tentacles and penis; **281**, protoconch (scale-line = 1 mm). **282**, *I. latiriformis*: radula (scale-line = 0,05 mm). **283–284**, *F. tayloriana*: **283**, operculum; **284**, radula (scale-line = 0,05 mm).

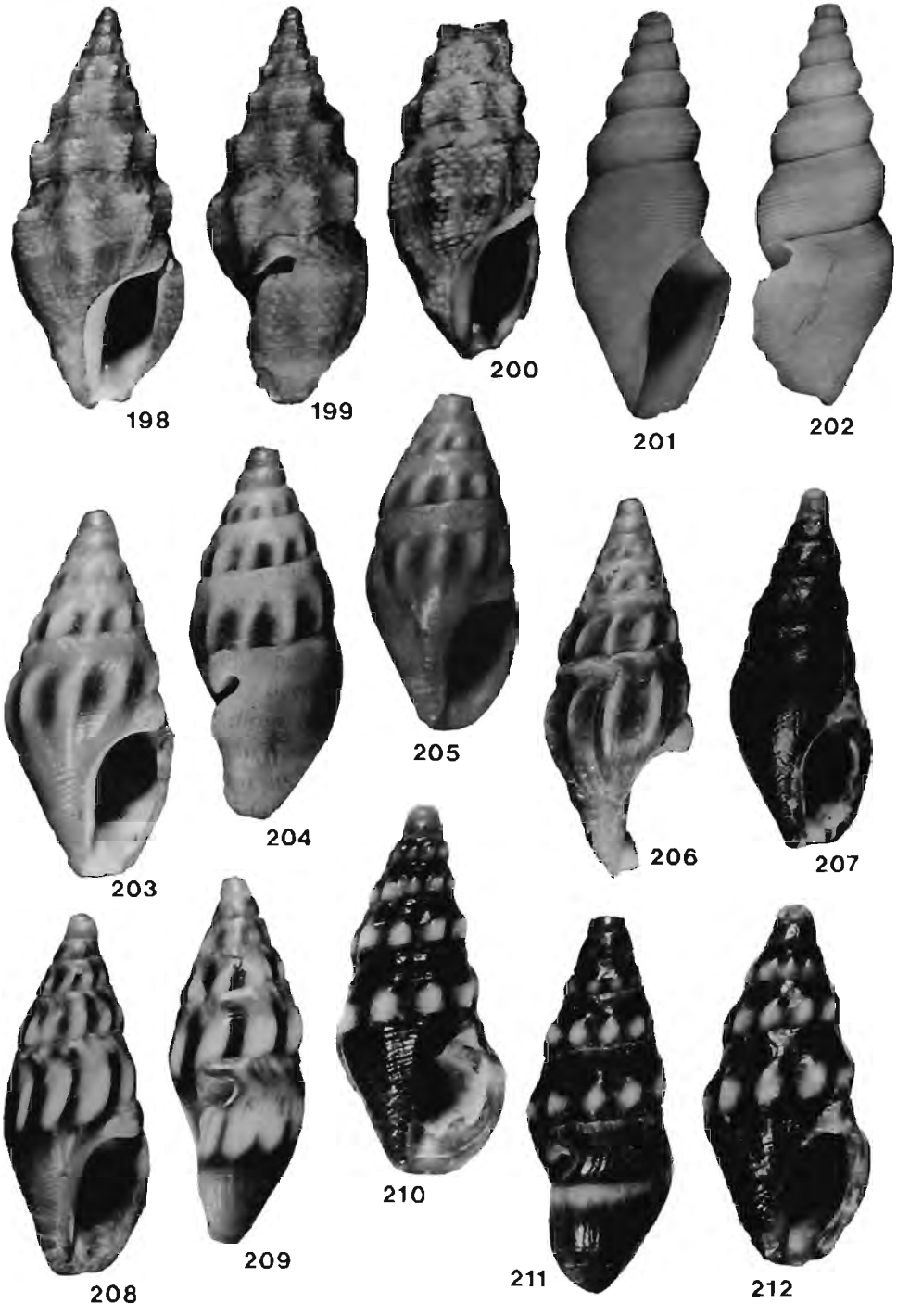
Figs 170–284 follow



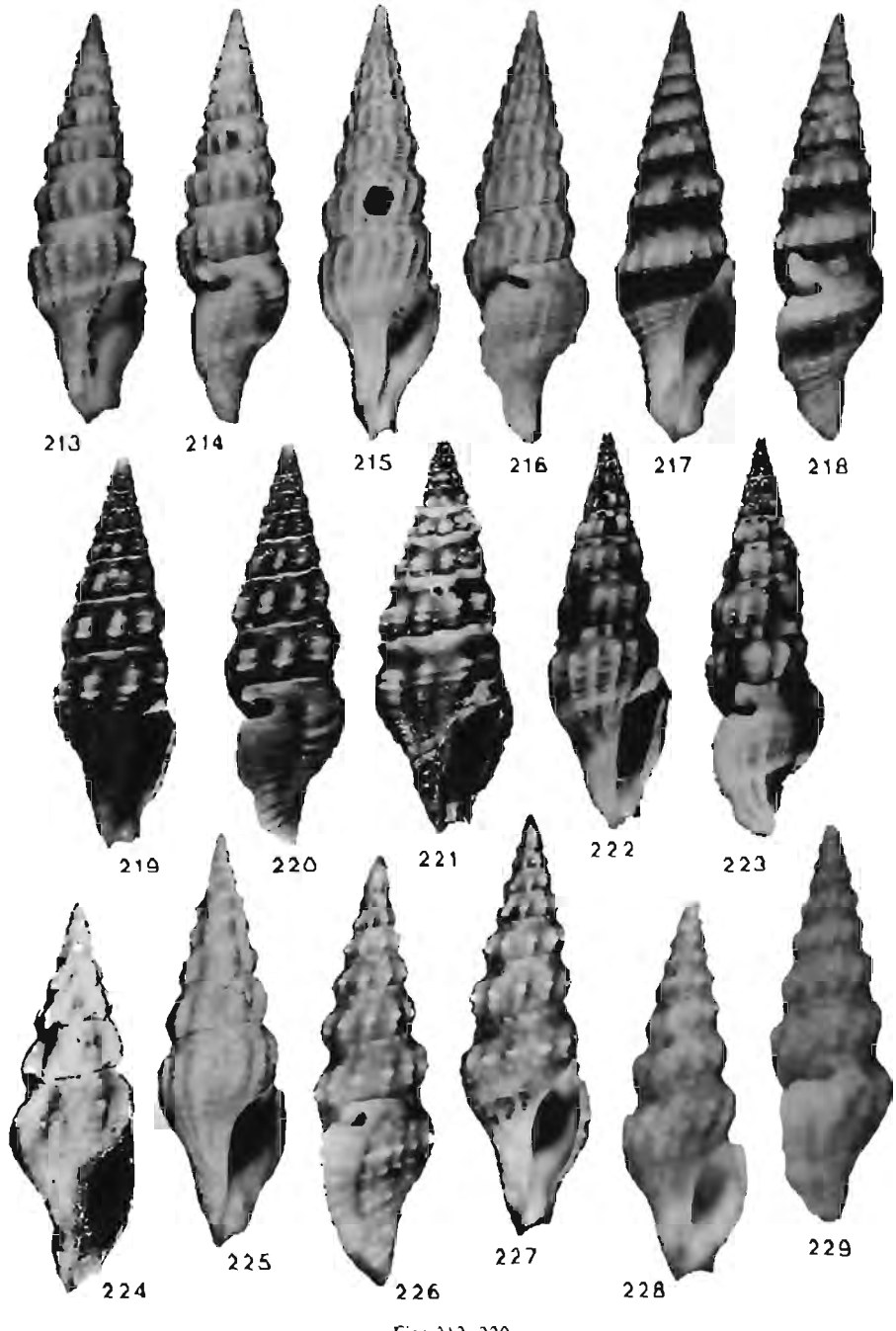

Figs 170–183




Figs 184–197




Figs 198–212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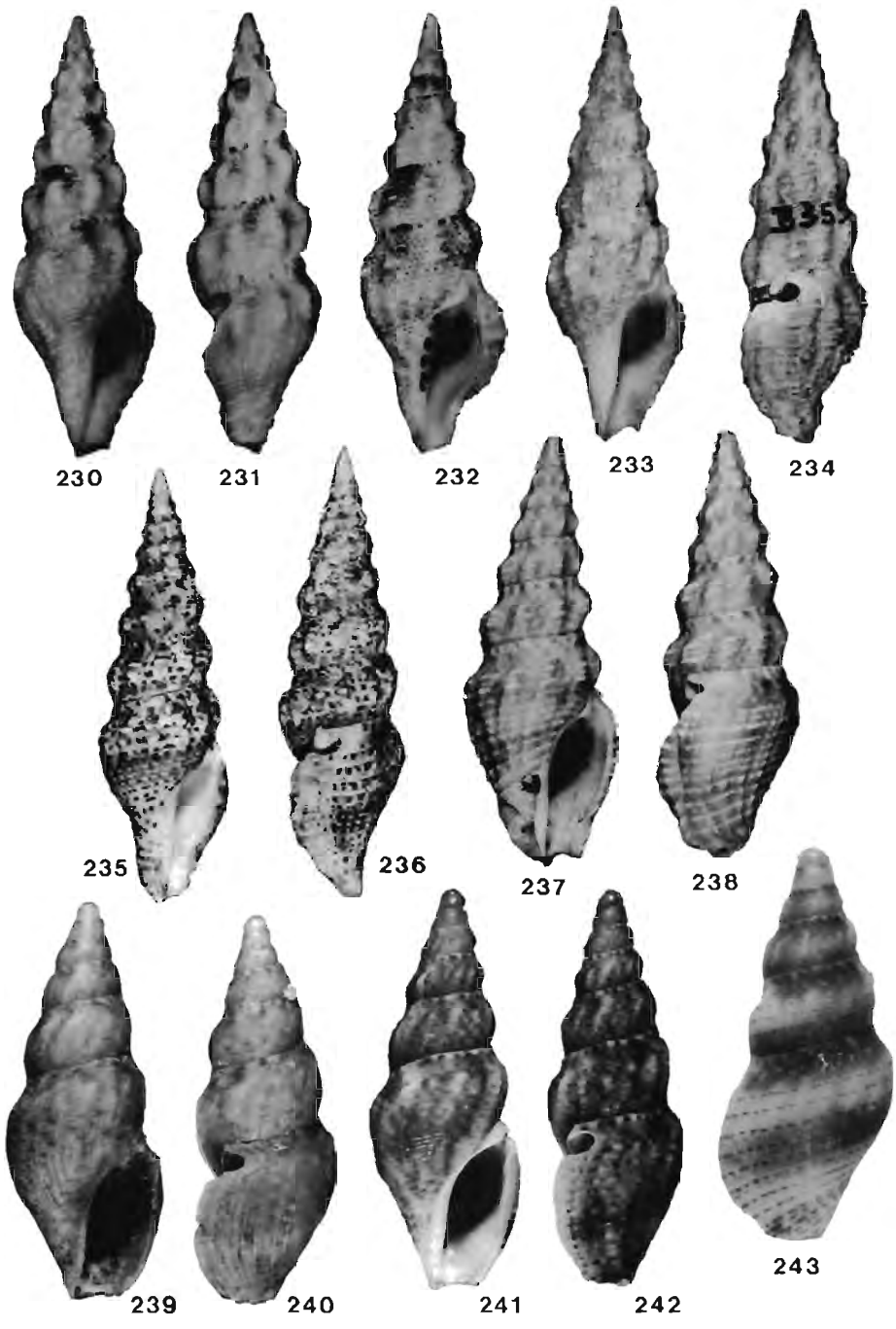
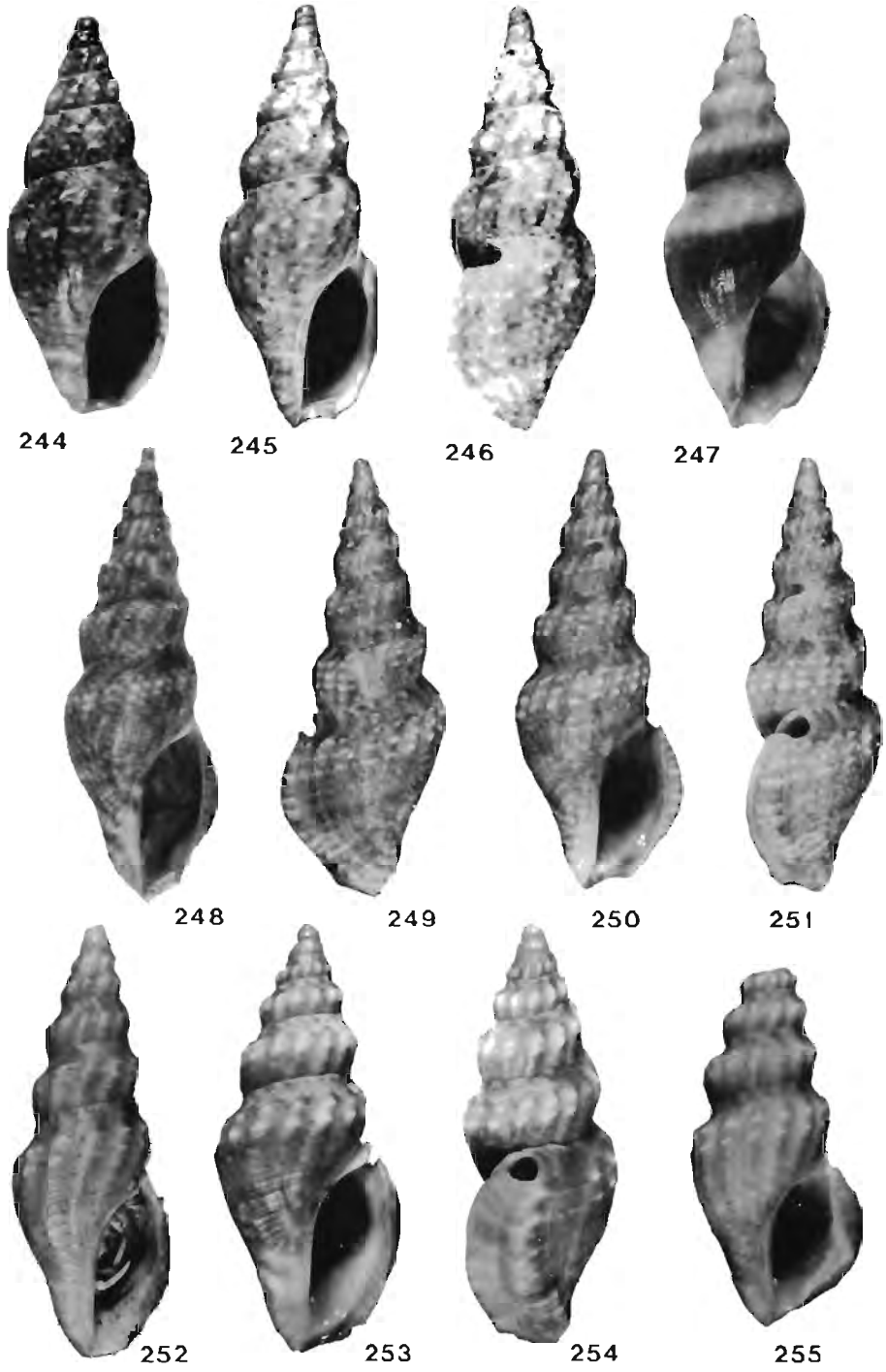
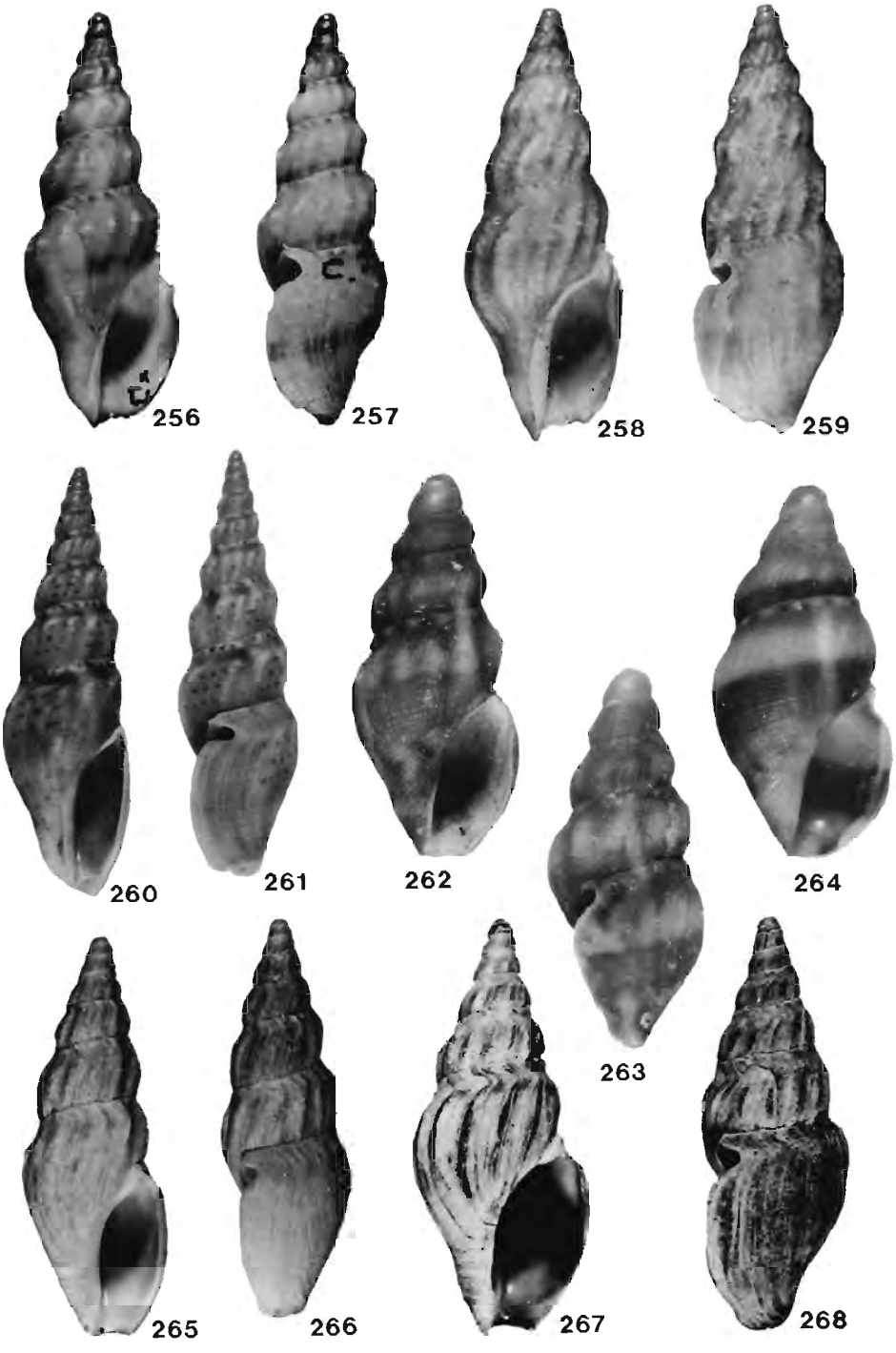
Figs 213–229



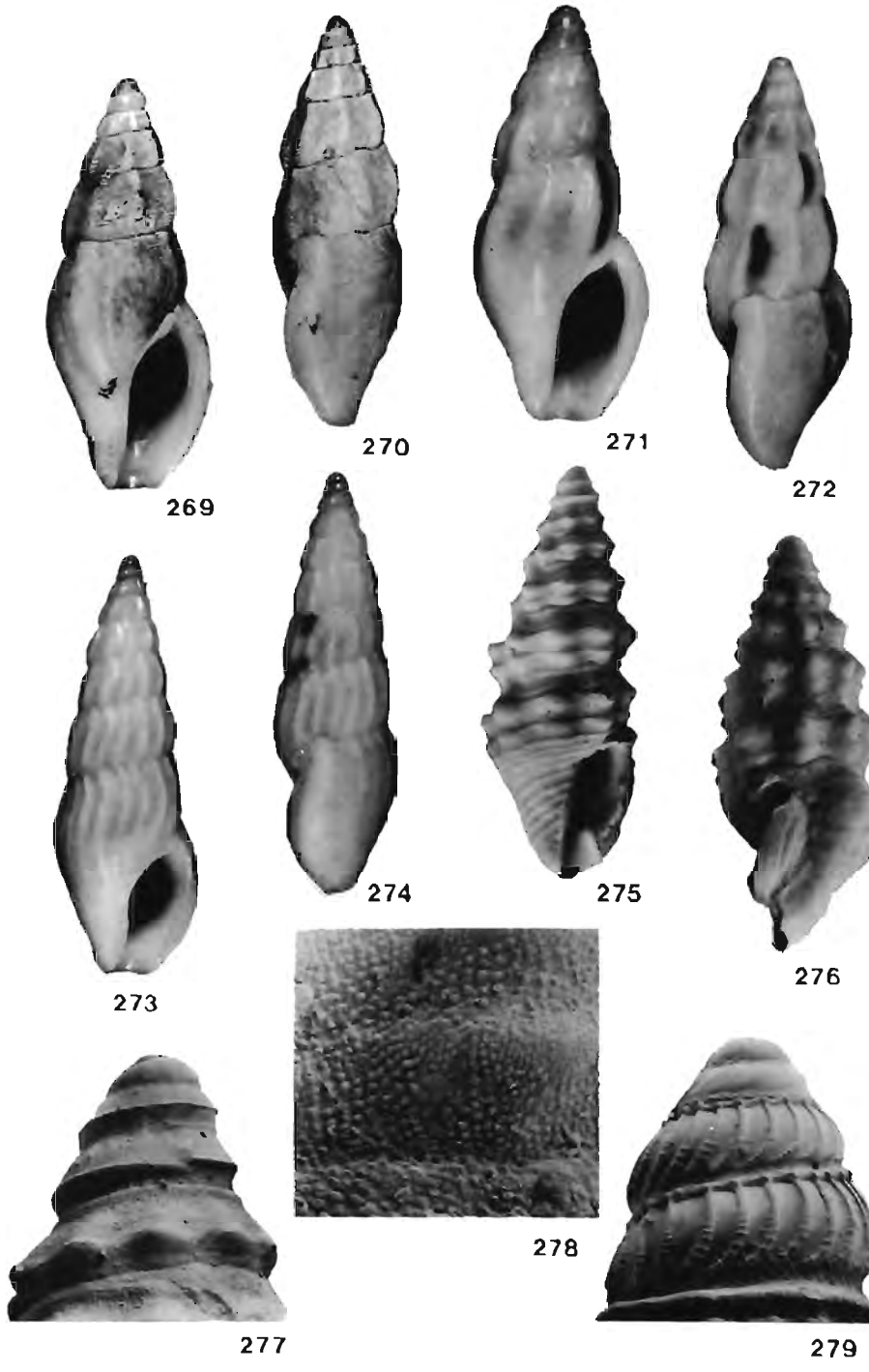

Figs 230–243



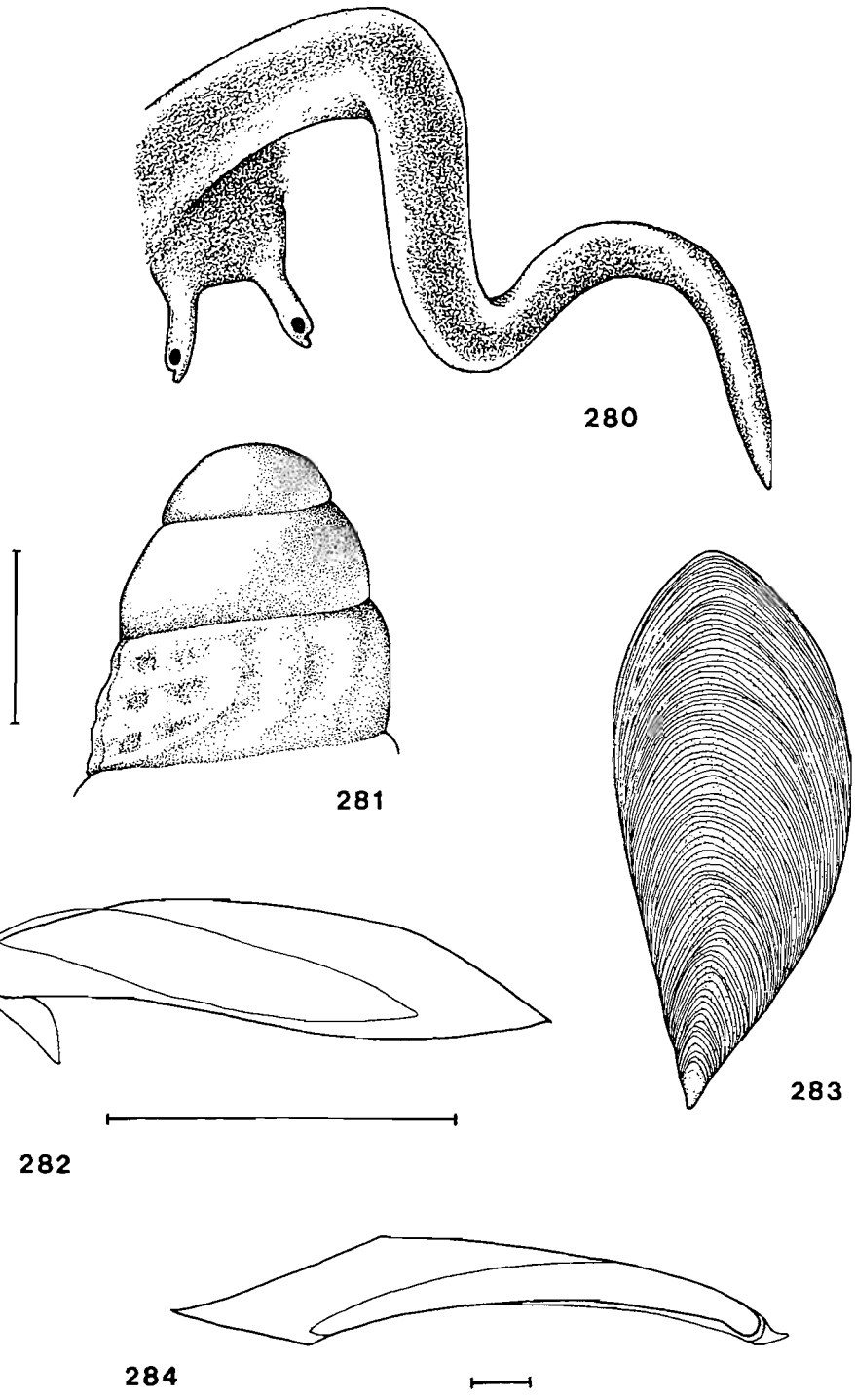

Figs 244–255




Figs 256–268




Figs 269–279




Figs 280–284

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